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**Treatment Effectiveness for Offenders with Autism Spectrum Conditions: A Systematic Review.**

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**Abstract:** Theoretical suppositions suggest a potential vulnerability in some individuals with autism spectrum conditions (ASCs) to displaying offending behaviours. Additionally, it is recognised that the features of ASCs may result in possible barriers to treatment. A systematic review was undertaken to identify empirical evidence examining the effectiveness of treatment programmes for offenders with ASCs and to explore the potential impact of ASC symptoms on treatment outcomes. The studies identified consisted of a small number of case series and a collection of case reports with little or no direct comparisons to offenders without ASCs. A synthesis of the findings highlighted variability in treatment approach and impact. Effectiveness was primarily defined by reduction in further offending behaviours and was found to be variable across the data. The potential relationship between the symptoms of ASCs and treatment outcome was explored with all case reports identifying the need for adaptations to treatment programmes, necessitated by the symptoms of ASCs. This systematic review joins an existing body of literature emphasising need for more controlled research into the effectiveness of offending behaviour treatment programmes for individuals with ASCs, and for further investigation into the impact of the clinical features of ASCs on treatment outcomes.

**Keywords:** Autism Spectrum Condition, Autism Spectrum Disorder, Offending Behaviour, Criminal Behaviour, Treatment.

## Introduction

Originally identified in 1943, autism has become widely recognised in today's society. The aetiology of autism remains poorly understood however, with research being undertaken in the fields of genetics, neurology and psychology (Baron-Cohen et al., 2000; Muhle, Trentacoste & Rapin, 2004; Pellicano, 2010). Historically thought to be a single disorder (Kanner, 1943), it is now classified as a collection of disorders or conditions, characterised by impairments lying along a spectrum which reflect impairments in communication, social interaction and inflexible thinking styles (Wing & Gould, 1979; American Psychiatric Association, 2000, 2013). Kanner (1943) described autism as an "*inability to relate*" (p242), and the combination of clinical features results in social and communication difficulties, problems with generalising information, difficulties with empathy, resistance to change, impairments in understanding social rules, social isolation or withdrawal, stereotypies and ritualistic behaviours, and obsessions or special interests (Attwood 2007; Baron-Cohen, 1989; Tantam, 2011). It has been suggested that some of these features leave individuals with

Autism Spectrum Conditions (ASCs) vulnerable to offending behaviours (Barry-Walsh & Mullen, 2003; Howlin, 2004; Katz & Zemishlany, 2006). For example, special interests or obsessions, and difficulties with empathy or impairments in social understanding have been implicated in violence, arson and sexual offending (Baron-Cohen, 1988; Griffin-Shelley, 2010).

### **Autism Spectrum Conditions**

The spectrum of autistic conditions previously included classic autism, Asperger's Syndrome (AS) and High Functioning Autism (HFA), regressive autism and atypical autism (WHO, 1992; APA, 2000). The updated Diagnostic and Statistical Manual (APA, 2013) has recently incorporated these previous diagnoses, along with pathological demand avoidance (PDA), pervasive developmental disorder not otherwise specified (PDDNOS) and childhood disintegrative disorder under the umbrella category of Autism Spectrum Disorders (ASD), stressing a stronger focus on identifying need and level of support rather than diagnostic classification (APA, 2013).

Extreme neglect can also result in a clinical presentation resembling autism (Rutter, Andersen-Wood, Beckett et al., 1999) and autistic-style behaviours can be seen in those not on the spectrum (Baron-Cohen, Wheelwright, Skinner, Martin & Clubley, 2001), however, these are not typically identified as 'autism'. Prevalence rates of ASCs in the general population are estimated at around 1% (Baird, Simonoff, Pickles et al., 2006), with a higher number of males receiving a diagnosis than females (Kopp & Gilberg, 2011; Newschaffer, Croen, Daniels et al., 2007). This sex difference however, has been shown to decrease as presence and severity of intellectual disability increases (see Halladay, Bishop, Constantino et al., 2015) and greater recognition of the potential differences in presentation has also raised questions regarding potential gender biases in the assessment of ASCs (Constantino &

Charman, 2012; Dworzynski, Ronald, Bolton & Happè, 2012). For example, females on the spectrum have been shown to score higher on measures of social and adaptive functioning and display less repetitive or restrictive behaviours (Head, McGillvray & Stokes, 2014; Lai, Lombardo, Pasco et al., 2011). This profile may enable girls on the spectrum to hide or ‘camouflage’ the features of ASCs (Rynkiewicz & Lucka, 2015; Rynkiewicz, Schuller, Marchi et al., 2016; Wing, 1981b), and thus not be captured by diagnostic assessment tools such as the Autism Diagnostic Observation Schedule (ADOS, ADOS-2) (Lord, Rutter et al., 2000, 2012).

Although included under global policies such as the UN Convention of the Rights of Persons with Disabilities (CRPD, 2007), the increased recognition of ASCs has led to the development and implementation of a number of specific laws and national strategies for individuals diagnosed with ASCs. For example, national Autism strategies exist in England and Wales (*Think Autism. Fulfilling and Rewarding Lives. The Strategy for adults with Autism in England, 2014*), Scotland (*Scottish Strategy for Autism, 2011*), Australia (*Autism State Plan<sup>1</sup>, 2009*), Hungary (*National Autism Strategy, 2010*), and most recently, Spain (*Spanish Strategy on Autism Spectrum Disorders (TEA), 2015*). In England and Wales, this also includes the introduction of the Autism Act in 2009 and the development of national guidelines by the National Institute for Health and Care Excellence (NICE) for the assessment and management of ASCs (NICE, 2011<sup>2</sup>, 2016<sup>3</sup>), including support for those who display behaviour that challenges (NICE, 2015). Additionally, for those individuals who operate outside the laws of society, recent updates to the Autism Strategy (DoH, 2015) now include statutory guidance for individuals with ASCs who come into contact with the criminal justice system in England and Wales.

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<sup>1</sup> Victoria,

<sup>2</sup> CG128 for those under 19 years

<sup>3</sup> CG142 for adults

## ASCs and Offender Treatment

Greater identification of individuals with ASCs in psychiatric and forensic services, and a number of high profile single cases have brought debates about ASCs and anti-social behaviour into the public domain. These debates have led to suggestions of a possible association between ASCs and offending, as was also the case for intellectual disabilities in the past (Barry-Walsh & Mullen, 2003; Howlin, 2004; Silva, Leong & Ferrari, 2004).

Early research focused on a small number of individuals or a collection of case reviews which indicated a possible proclivity for arson, aggression and sexual offending (Allen et al., 2008; Kohn, Fahum, Ratzoni & Apter.,1998; Siponmaa, Kristiansson, Jonson, Nyden & Gillberg, 2001), with the core features of ASC being implicated in, or a component of, the offending behaviour. For example, social naivety, reduced victim empathy, theory of mind deficits, and special interests/obsessions (Dein & Woodbury-Smith, 2010; Geluk et al., 2012; Howlin, 2004; Wing 1981a) have all been identified, along with weak central coherence, which has been suggested to impact upon an individual's ability to be able to foresee and understand the consequences of their actions (e.g. Woodbury-Smith & Dein, 2014; Murphy, 2010a, 2010b). A number of these factors are congruent with existing theories of offending, such as General Strain Theory (Agnew, 1992, 2013), and more specifically, models of victim empathy deficits and cognitive distortions for sexual offending behaviours (e.g. Marshall, Hudson, Jones & Fernandez, 1995; Ward, et al., 2000).

The clinical features of ASCs that may leave an individual vulnerable to displaying offending behaviour could potentially lead to assessment and therapeutic issues that impact negatively upon treatments. For example, cognitive inflexibility, and difficulties with victim empathy and social perspective-taking may result in barriers to achieving treatment outcomes (e.g. Griffin-Shelley, 2010; Murphy, 2010a, 2010b). Additionally, the group nature of many

offender treatment programmes may be challenging for an individual with an ASCs. Issues of capacity and consent can also present difficulties when considering drug therapies such as the use of anti-libidinal medication for sexual offending (e.g. Milton Duggan, Altham, Egan & Tantam, 2002).

The effectiveness of offending treatments is typically measured by further incidents of criminal behaviours, e.g. re-offending or recidivism (reconviction) (Andrews & Botna, 2010). For individuals outside the criminal justice system, such as those diverted to hospital under the Mental Health Act (1983, as amended, 2007), measures like re-arrest or re-conviction may not be appropriate; however, subsequent offending behaviours are still used to assess treatment efficacy (e.g. Radley & Shaherbano, 2011; Ray et al., 2004).

Meeting the treatment needs of offenders with ASCs can be complicated further by the presence or absence of an intellectual disability. A recent population-based study from Western Australia found 70% of live births with an ASC diagnosis also had a co-morbid intellectual disability or unknown level of intellectual disability (Bourke, de Kerk, Smith & Leonard, 2016). Bryson, Bradley, Thompson and Wainwright (2008) identified 28% of adolescents with intellectual disability as also having an ASC within their study, and Turk (2012) reported that 70% of children with ASCs had a non-verbal IQ below 70, with only 5% of children with ASCs having a non-verbal IQ above 100. As ASCs can present with or without a co-morbid intellectual disability the treatment difficulties associated with ASCs may be met in standard or adapted offender treatment programmes. Furthermore, the uneven or 'spikey' neurocognitive profile associated with ASCs, particularly in Asperger's Syndrome or High Functioning Autism, can result in a verbal ability which gives an impression of greater comprehension, with adaptive and/or social functioning perhaps being

more impaired, despite IQ being above the cut-off used for intellectual disabilities ( $\leq 70$ , ICD10, 1992), potentially resulting in inappropriate placement in non-adapted programmes.

The positive changes that have come with increased recognition of ASCs in UK social policy have led to the development of ASC specific service provision, predicated on the hypothesis that this group presents with challenges which are separate from intellectual disabilities alone. However, specialised or adapted treatment programmes for individuals with ASCs remain sparse, despite the distinct profile and recognition that some with ASCs may experience difficulties with traditional offender treatment, thus resulting in an ostensible gap between policy and evidence-based practice.

The aim of this review therefore was to conduct a comprehensive search of the literature to (a) identify and synthesise studies that attempted to examine the effectiveness of treatment for offending behaviour amongst individuals with ASCs, and (b) explore the relationship between the symptoms of ASCs and treatment outcome.

## **Methodology**

### **Search Protocol**

To identify existing literature on ASCs and offender treatment, the search string using the terms “*(autis\* or Asperger\* or ASC or ASC or pdd or pervasive developmental dis\*) AND (offen\* or crim\* behav\*) AND (treat\* or interven\* or therap\* or program\*)*” was entered into a number of databases including EBSCO, Web of Science, Scopus and PubMed.

Curated databases were initially searched, however this was then expanded to include grey literature (OpenGrey, Social Sciences Research Network and Social Care Online).

The databases were originally searched on 9/11/2015 and then updated on 11/1/2016 and 1/11/16. Slight variations in the search string were made for the grey literature searches to



accommodate the database parameters. The full search strategy and databases can be obtained from the first author.

The ancestry method was also applied and a hand search of the latest issues of the top two journals for articles in the review<sup>4</sup> was undertaken to ensure the search was as comprehensive as was possible.

The search results from the screening and review data are depicted in the PRISMA model flow chart (Figure 1), along with the exclusion criteria.

### **Eligibility Criteria**

Eligible studies were published in English, and (1) included original empirical data, (2) related to an ASC specific sample or distinguished participants with ASCs from intellectual disability alone/non-ASC participants, and (3) referred to a psychological or pharmacological treatment outcome or have designed/applied a particular treatment for offending or criminal behaviour. No date limiters were applied however, book chapters, conference abstracts, theses and articles such as narrative and other reviews, policy documents, theoretical papers, editorials and commentaries, etc. were excluded.

Offending/criminal behaviour was selected for this review rather than 'challenging behaviour' because challenging behaviour refers to a more global notion of inappropriate, maladaptive, dysfunctional or anti-social, behaviour that places an individual at risk of harm or of exclusion from community involvement (McCarthy, Hemmings, Kravariti et al., 2010). Challenging behaviour includes pica, self-harm, stereotypies and other such manifestations that would not typically constitute offending, as well as aggression and sexually inappropriate

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<sup>4</sup> *Journal of Applied Research in Intellectual Disabilities and Sexual Addiction and Compulsivity*

or harmful behaviours (Emerson & Bromley, 1995). Typically, those with challenging behaviour have a more severe or profound intellectual disability, with or without autism, whereas those who are involved in the criminal justice system tend to have milder disabilities or no disabilities (partly due to the *mens rea* requirement in many jurisdictions). There is an established body of research into challenging behaviour in individuals with ASCs, including studies on intervention and investigation into use of medication for behaviour that challenges (Matson & Rivet, 2008; Sawyer, Lake, Lunskey, Liu & Desarkar 2014).

For those with more severe intellectual disabilities or younger individuals (perhaps below the age of criminal responsibility) some behaviours such as fetish or hypersexualised displays may manifest as acts that constitute offending but are not labelled as such due to the age and/or cognitive functioning of the individual (e.g. Deepmala & Agrawal, 2014; Coskun & Mukaddes, 2008). In these cases, behavioural therapy or medication may be utilised rather than approaches typically employed for adult or juvenile offenders such as cognitive behavioural therapy or psychotherapy, and they were therefore not included in the review. Additionally, offending or criminal behaviour was distinguished from challenging behaviour as treatment and practice guidance, such as NICE guidelines, require interventions for challenging behaviour to focus treatment outcomes on improving quality of life (NICE, 2015) whereas offending treatments tend to be focused on reductions in future behaviours and public protection (Andrews & Botna, 2010; Ward & Maruna, 2007). Whilst offending programmes can strive to improve quality of life for the offender, it is not typically the primary treatment objective (Doyle, 2004; Ward & Maruna, 2007), and that is what was being investigated in this review.

A total of 1311 hits resulted from the search. Following removal of duplicates, 1164 titles and abstracts were screened using the inclusion and exclusion criteria, as depicted in Figure 1.

166 full text records were reviewed the majority of which were excluded because they: (i) did not differentiate between intellectual disability and ASCs in the sample (44), (ii) did not include original, empirical data into the effectiveness of treatment (41), or (iii) were concerned with ASCs in general and not focused on offending or treatment/therapy (39).

Following the full text review 13 publications met the inclusion criteria and were included in the review.

[Figure 1: PRISMA Chart of Search Results]

### **Quality Appraisal**

No design specifications were set to be included in the review. This was due to the anticipated low number of studies in this area (guided by previous experience from non-systematic literature searches). No randomised or non-randomised controlled trials (RCTs) were found within the results. The data set consisted of nine case reports and four case series. None of the studies contained within this review would meet the criteria for inclusion using the GRADE methodology (Guyatt et al. 2008), reflecting the quality of data found. The GRADE approach, developed by the Grading of Recommendations, Assessment, Development and Evaluations (GRADE) Working Group, 'upgrades' RCTs over other study designs and is used in Cochrane reviews and adopted by NICE (Brozek et al., 2009; Dennis et al., 2012; Dijkers, 2013) in assessing evidence quality for clinical practice recommendations. It was felt that GRADE would not be an appropriate tool for this review due to the distinct lack of RCTs and that it would be too conservative to yield any helpful results. There is debate over the hierarchy of evidence (e.g. Tucker & Roth, 2006) and the biases inherent in relatively uncontrolled methodologies such as reversal and single case designs, however, as the purpose of this review was to identify and evaluate *existing* data, the inclusion of less rigorous designs was necessary.

Study quality was rated by the first and second author using the Mixed Methods Appraisal Tool (MMAT) (Pluye, Robert, Cargo et al., 2011) which allowed for the different designs to be appraised concomitantly by one tool (IRR: 92%). As a result of the low numbers of studies available, all articles were included in the final review (MMAT appraisal tables of the studies within this review can be obtained from the first author).

Using the MMAT criteria, the quantitative data (case series) scored 4\* (out of 4). These studies employed pre- and post- measures designs and included information regarding recruitment sources/methods, had low dropout rates and accounted for any missing or repeated data. All four studies were classed as quantitative descriptive rather than non-randomised controlled trials as none included a control group. These design limitations unfortunately are not accounted for within the MMAT (as reflected by a score of 4\*).

It is important to note that three of the quantitative studies refer to the same treatment programme (Heaton & Murphy, 2013; Murphy et al., 2007; SOTSEC-ID, 2010) and two are discussing the same sample at different time periods (Heaton & Murphy, 2013; SOTSEC-ID, 2010). Therefore, the thirteen articles included in the review essentially refer to twelve studies. There are arguments against including these individually within the review, however again due to the lack of evidence and research completed in this area, it was felt important to include as much as possible of available data.

The qualitative data overall scored considerably lower (as shown in Tables 1 and 2). A number of the case studies did not emphasise their research objective i.e. explicitly stating their aims in using the case study. Additionally, identification of data sources and methods of analyses were frequently unclear, as well as the authors' role (for example, it was sometimes unclear how much information came from direct contact with the individual in the study and how much came from previous records/data).

Additionally, the authors did not typically acknowledge their role in delivering the treatment or provide alternative suggestions to the treatment considered or offered at their facility. The only exception was Griffin-Shelley (2010) who suggested that perhaps an addiction recovery approach would be better suited rather than an offender model for treatment of an individual with Asperger's Syndrome and sexual addiction.

## Results

Due to the limited availability of data and the mixed methodologies used, a meta-analysis of the data was not possible. The results are therefore presented as narrative synthesis.

[Table 1: Quantitative Studies included in review]

[Table 2: Qualitative Studies included in review]

**Aim 1: identify and synthesise studies that attempted to examine the effectiveness of treatment for offending behaviour amongst individuals with ASCs.**

Effectiveness was examined in terms of further incidents of offending behaviour within studies. Quantitative studies were addressed first, followed by the qualitative case reports. A number of themes emerged from analysis of the qualitative data and are presented in Table 3.

A total of seventy-five participants displaying offending behaviour were included in the studies in this review. ASC diagnoses were identified for thirty individuals across the studies and were reported as: Asperger's syndrome (40%), ASC or ASD (50%), Autism (7%) and Pervasive Developmental Disorder (3%). Of the offending information available regarding

the individuals diagnosed with an ASC<sup>5</sup>, 15 displayed sexual offending behaviours (57.8%), 3 were convicted of manslaughter (11.5%), 4 had committed arson (15.4%), 5 showed violent or aggressive behaviours (19.2%), 2 had committed theft (7.7%), 1 had made impersonal threatening behaviours (3.9%), and 1 had convictions related to firearms<sup>6</sup> (3.9%).

### **Quantitative studies.**

As reported in the results, no randomised controlled trials were found nor were any experimental studies with control or comparison groups part of the results. The few clinical case series that were included had no comparison or control group or were pilot studies with low *n*. The studies however do provide empirical data explicitly in relation to treatment effectiveness in offenders with ASCs.

*Effectiveness of treatment:* The Langdon et al. (2012) pilot study of the EQUIP programme for offenders with intellectual disabilities did not find overall improvement in problem solving abilities, including in those participants with ASCs, however the authors identified that the participants with ASCs did appear to benefit from the treatment despite their potential difficulties in social-perspective taking (p.178).

The treatment programme addressing harmful sexual behaviour that was evaluated in Murphy et al. (2007), SOTSEC-ID (2010) and Heaton and Murphy (2013) suggested lower treatment efficacy for offenders with ASCs compared to those with ID alone. A diagnosis of ASC was associated with higher rates of recidivism and was identified as an associated risk factor for future recidivism in the initial pilot study and subsequent follow up studies. However, caution was exercised in generalising these results and Murphy and colleagues also commented on how those with ASCs were more likely to commit non-contact sexual

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<sup>5</sup> Individual data unavailable from Murphy et al., (2007) and SOTSEC-ID (2010).

<sup>6</sup> Percentages add up to more than 100% due to multiple behaviours displayed by participants.

offences than contact sexual offences (Heaton & Murphy, 2013; SOTSEC-ID, 2010), for which there is some evidence suggesting higher recidivism rates (e.g, Mair & Stephens, 1994), and therefore this may have impacted upon the apparent increased recidivism rate associated with ASCs in this group.

*Potential influence of ASCs on offending:* The potential role of ASCs in the offending behaviour was briefly discussed in both the Langdon et al. (2012) and Murphy et al. (2007) pilots, with each referring to the possible difficulties individuals with ASCs may experience in understanding another's perspective and/or feelings. However, the potential influence of the clinical features of ASCs on the offending behaviour was not discussed in the SOTSEC-ID (2010) paper or subsequent follow up (Heaton & Murphy, 2013).

It is important to note that the four quantitative studies were from very specific settings (secure units and/or Community Learning Disability Teams), targeting a particular group of individuals within this offending population thus limiting the generalisability of any conclusions.

*Possible impact of ASC features on treatment:* None of the case series directly addressed the appropriateness of treatment for individuals with ASCs. For example, victim empathy and addressing cognitive distortions are key components in treatment addressing sexual offending, including programmes adapted for offenders with intellectual and developmental disabilities. Additionally, the EQUIP programme also targets cognitive distortions. The cognitive profile of individuals with ASCs includes inflexibility of thought, and results from the SOTSEC-ID (2010) study showed significantly poorer pre-, post- and follow-up treatment

score for one of the measures of cognitive distortions<sup>7</sup> for men with ASCs compared to men with intellectual disability alone.

### **Qualitative studies.**

*Effectiveness of treatment:* The case reports identified in the search strategy varied in their quality and detail regarding the implementation and effectiveness of treatment of offenders with ASCs. For some, effectiveness was directly referenced to reductions in offending behaviours (in frequency or severity) e.g. Griffin-Shelley (2010), Kelbrick & Radley (2013) and Kohn et al. (1998). Reductions were linked to clinical judgement and observations of improvement, with specific details rarely given i.e. measurement/logging of behaviours pre- and post-treatment, such as in Milton et al., (2002). Some of the studies also referred to ‘implicit’ improvements outside the offending behaviour e.g. social skills development, improved emotion regulation/recognition and increased understanding of mental health diagnoses (e.g. Faccini, 2014; Kelbrick & Radley, 2013; Radley & Shaherbano, 2011).

[Table 3: Qualitative Themes from Studies included in review]

Six of the eleven case studies reported a reduction in further instances of offending behaviour implying effectiveness of treatment. Two of the case reports refer to medication being used for offending behaviours (as opposed to for mental health issues e.g. psychosis or anxiety), in order to supplement behavioural or psychological treatments or as a last resort when other interventions have shown no effect e.g. Milton et al. (2002), Kohn et al., (1998). The results were variable in terms of medication impact on offending behaviours, with one study demonstrating a reduction (Kohn et al., 1998) and the other not (Milton et al., 2002).

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<sup>7</sup> the Questionnaire on Attitudes Consistent with Sexual Offending (QACSO) (Lindsay et al, 2006).



The effectiveness of medication across these studies cannot be directly compared as one was for sexual behaviours and the other for aggression, also they were administered in conjunction with other psychotherapeutic treatments. They have been included in this review to demonstrate their use in treatment for individuals with ASCs who display offending behaviour and the mixed results found within these studies reflect the ongoing debate regarding use of medication in offending and behaviour that challenges (McPheeters et al., 2011; Sawyer et al., 2014).

A variety of psychological interventions were referred to across the case studies. Some were specific, referring to a particular approach i.e. Cognitive Behavioural Therapy (CBT), Cognitive Analytical Therapy, Reconstructive Therapy, etc. (Faccini, 2014; Kelbrick & Radley, 2013; Murphy, 2010a); whereas other gave little details about the intervention. For example, Radley & Shaherbano (2011) referred to the individual seeing a psychologist and undertaking “*individual work, addressing his substance misuse and his fire-setting*” (p34), and Chan & Saluja (2011) simply stated that the individual “*was put on the sex offender’s programme to undergo psychological treatment*” (p903).

Radley and Shaherbano (2011), Kelbrick and Radley (2013) and Faccini (2014) reported treatment effectiveness and a reduction in offending behaviours. Additionally, despite the ongoing problems with interpersonal and sexual conduct, the post-treatment behaviours referred to in the Griffin-Shelley (2010) study could be referred to as less severe i.e. ordering adult movies and accessing pornography compared to contact offences, and also, less frequent (self-reported reduction) in masturbation. Those studies reporting positive treatment effects included Cognitive Analytical Therapy, Cognitive Behavioural Therapy, Group Therapy, Reconstructive Therapy and Relapse Prevention approaches to treatment.

As well as specific offender treatment, Radley and Shaherbano (2011) and Kelbrick and Radley (2013) also had a wider treatment programme available including psycho-education, occupational therapy and social skills training. Supplementary therapies were also mentioned in a number of the other reports, which did not appear to reduce offending behaviour (Milton et al., 2002; Murphy, 2010a). Most case studies, regardless of effectiveness of offender treatment, referred to the need for adaptations or removal from group programmes for the individuals with ASCs (Milton et al, 2002; Murphy, 2010a; Radley & Shaherbano, 2011).

The remaining five case studies reported little or no change in offending behaviours following treatment. Of these, Murphy (2010a) explicitly refers to CBT, whilst others refer to 'group therapy' within a personality disorder programme (Milton et al., 2002), or a general description of 'sex offender treatment programme' (Chan & Saluja, 2011). Psychotherapy and family therapy were used in Kohn et al. (1998) and a variety of methods were reported by Ray et al. (2004) with a specific approach unclear.

It is important to note that the data collected from this search was small and as said, variable in quality, therefore there was no way of determining if a particular treatment approach or intervention was more effective for offenders with ASCs than others from the results.

*Potential influence of ASCs of offending:* There is a large amount of detail within the case studies regarding the potential role of ASCs in committing of the offence. Special interests are referred to in six of the nine studies, for example, Radley & Shaherbano (2011) discuss their service user's 'special interests' in fire and witchcraft and the potential role these played in the individual committing an arson offence and a number of the studies on sexual offending behaviours discuss pre-occupations and 'special interests' (e.g. Chan & Saluja, 2011, and Milton et al., 2002).

Social and communication difficulties were also a common theme across the case studies (Faccini, 2014; Griffin-Shelley, 2010; Kelbrick & Radley, 2013; Kohn et al., 1998; Murphy, 2010a; Radley & Shaherbano, 2011). These difficulties were identified particularly in relation to theory of mind and social perspective taking and appeared to be a key factor in the offending, supporting suggestions made in existing literature regarding the potential influence of ASCs characteristics in offending (Dein & Woodbury-Smith, 2010; Howlin, 2004).

Another point of emphasis throughout the data was the difficulty participants experienced in being able to anticipate consequences or implications of behaviour. For example, Murphy (2010a) gives a detailed account of the schema and thought processes involved in the lead up to the offence and the author identifies that despite considerable therapy (over 70 hours) the individual remains cognitively inflexible in his view of the offence (i.e. believes that it was justified). This is again in line with suggestions regarding the possible impact of ASCs on offending and goes towards providing empirical evidence for cognitive inflexibility and the potential influence of weak central coherence and inability to anticipate the consequences of offending behaviour

All case studies referred to the role of ASCs in the actual offence, however again, this appears to be based on clinical judgement as opposed to standardised measurement or formal assessment. The case studies provided variable amounts of detail regarding background information, behaviour and offences, however as identified by the MMAT, few of the authors identified the source of their data and as a result it is undetermined how much of the clinical judgement is based on interactions with the offender and how much is from a case history, observations or document review (the exception being Kohn et al. 2002).

**Aim 2: Explore the relationship between the symptoms of ASCs and treatment outcome.**

*Possible impact of ASC features on treatment:* None of the case reports attempted to directly assess the impact of the clinical features of ASCs on treatment outcomes. References were made with regards to a ‘special interest’ (e.g. Milton, 2002) or ‘empathy barrier’ (e.g. Griffin-Shelley, 2010), however formal or standardised assessment of these constructs were not reported and data appeared to come from comments or observations made by the author or clinical team rather than specific measures of ASC symptom severity.

Significance levels of treatment outcomes, clinical or otherwise, were not reported in any of the case studies.

*Availability and appropriateness of offender treatment programmes for individuals with ASCs:* All papers within this review referred to the lack of suitable treatment for individuals with ASCs who offend. Some also alluded to the lack of change in behaviours following hospitalisation and/or treatment. For example, Kohn et al., (1998) make reference to their service user being “*discharged after eight months with no real change in his behaviour*” (p296), and Milton et al., (2002) also refer to their service user’s previous extensive engagement with psychology and use of anti-libidinal medication showing no effect.

Many of the cases studies within this review discussed the inappropriateness of treatment programmes available, with one of the studies recommending removal of their service user from the current facility and treatment programme to a more appropriate service (Milton et al, 2002), which would be in line with the Mental Health Act (1983) Codes of Practice (2016). The Codes of Practice stipulate that where an individual with an ASC needs to be detained for treatment under the Act, they should be “treated in a setting that can accommodate their social and communication needs as well as their mental disorder” (MHA, 2016, 20.27, p210). Additionally, the recent revision of the Codes of Practice (2016) identifies that “*compulsory*

*treatment in a hospital setting is rarely likely to be helpful for a person with autism*” (ibid., p210), and less restrictive alternatives, in a familiar surrounding should be sought where possible.

Another case study highlighted the multiple failures in placements and repeated attempts at finding an appropriate treatment placement (Kohn et al., 1998). The majority of case reports aimed to highlight or emphasise the difficulties encountered by professionals in treating individuals with ASCs who offend, not only in terms of available treatment but also service provision. However, the more recent papers (e.g. Kelbrick & Radley, 2013) do make reference to specialist ASC units, potentially as a result of the changes in social policy and recognition of specific needs for individuals with ASCs (including offenders) and subsequent service provision.

All case studies referred to the individual programmes and adaptations made, where possible, in addressing the offending i.e. removal from group programmes and adapting CBT (e.g. Kohn et al., 1998; Murphy, 2010a). The case reports also spoke of the need for tailoring programmes to meet the offenders’ additional needs including psychoeducation and social skills work, as well as the need for other programmes such as education and occupational therapy (e.g. Radley & Shaherbano, 2011). As such additional programmes are unlikely to be specific to individuals with ASCs and will also apply to individuals with intellectual and other neurodevelopmental disabilities, it is possible that individuals with ASCs require specific adaptations.

## **Discussion**

The studies included in this review consist of a small amount of quantitative data from case series and a collection of case reports that explored the treatment of offending behaviour amongst individuals with ASCs. Despite a much larger ASC and offending literature identified by the search string, very few of the search results included original, empirical

data examining treatment effectiveness for those with criminal behaviour. A synthesis of the study findings highlighted the variability in treatment approach and impact. Effectiveness, primarily defined by reduction in further offending behaviours, was inconsistent across the data. The potential relationship between the features of ASCs and treatment outcome was explored in the literature, and all case reports identified the need for adaptations to treatment programmes, necessitated by the symptoms of ASCs e.g. removal from group programmes, social skills development and psycho-education.

*Generalisability/application of findings to wider population:* The quantitative and qualitative studies within this review are limited in the level of generalisability to the wider population of individuals diagnosed with ASCs who display offending behaviours. None of the case series studies and pilot research designs had control groups (who received no treatment or treatment as usual) and all were drawn from specific offender populations, thereby limiting the possibility of applying any conclusions regarding the effectiveness of the interventions to those outside these settings.

The qualitative case studies showed similarities across a number of features (as shown in Table 3), with common clinical presentation and repeated difficulties in service provision or appropriate treatment availability. Seven of the nine case studies also reported co-morbid psychiatric conditions, all of which were treated with medication. Despite these common themes, the data referred to a small number of individuals and was therefore idiosyncratic, with many potentially confounding variables that could have impacted the effectiveness of the treatment regardless of the individuals' diagnosis of ASCs. For example, the difficult family relationships following discharge in Griffin-Shelley (2010) could have reduced treatment outcomes and presented challenges to a successful reintegration back into the

community, which has been argued to be a key component in promoting and sustaining rehabilitation (Göbbels, Ward & Willis., 2012; Williams & Grace, 2012).

With increased commitment to evidence-based practice and social policy striving to meet the needs of individuals with ASCs, this timely review has highlighted substantial gaps in the literature regarding the evidence-base for the effective treatment of offending behaviour displayed by individuals with ASCs. The lack of robust, empirical evidence results in limited information available to professionals working to support this niche client group. The inconsistencies in treatment approach, and variability in outcome highlighted in this review emphasise a sizable gap between policy and practice for the treatment of individuals with ASCs who display offending behaviour.

### **Strengths and Limitations**

The systematic nature of this review with clear search protocols and methodology enabled the study to be reproducible, helping to ensure the findings were based on existing literature.

The limitations of this review included the quality of the data available and how it would fare in other appraisal tools such as the GRADE approach. All studies identified were included within this review despite their quality, this decision was made due to a lack of completed controlled studies available. Increasing the standard of quality may have potentially left no data to review and whilst this would clearly demonstrate a lack of evidence regarding the effectiveness of offender treatments for individuals with ASCs, it would not be reflective of the fact that work, however small, has been undertaken. This review therefore balanced the need for examining the available evidence by using a less stringent and established appraisal tool, the MMAT, and including all studies. In considering the high number of case studies in

this review it is also important to bear in mind biases in the publication of single case designs. These biases could result in gaps in published literature, leaving fewer articles for the search string to find. Clinicians or researchers may choose not to write up cases where ASCs posed no challenges or barriers to offender treatment. Alternatively, if cases are written up, journals may decline to publish articles on the successful implementation of an already established treatment. Additionally, clinicians/therapists or researchers may be reluctant to write up cases where therapy has ‘failed’ or been deemed ‘unsuccessful’ and those that do choose to submit for peer-review face the well-known publication bias for studies with positive results (Song, Parekh, Hooper et al., 2010). The grey literature searches attempted to address some of these biases however it yielded little, and could only account for the gap in peer-review journals and those cases written up.

A further gap in the research could exist from individuals with ASCs traditionally being included within intellectual disability and neurodevelopmental disorders (e.g. ADHD, TBI) populations. It is perhaps only with the provision of ASC specific services and a greater focus on research in this area that ASCs may now be examined as a potential variable in mixed intellectual and developmental disability samples.

A second limitation to the review is the literature potentially missed by use of the terms ‘offending’ and ‘criminal’ in the search string. The overlap in behaviours under the terms ‘challenging’ and ‘offending/criminal’ makes it likely that some studies were not returned in the search results. The focus of this review was on exploring the effectiveness of treatment for individuals with ASCs who display offending behaviour and therefore the search string was designed to elicit results where the behaviour was explicitly stated as offending or criminal or framed in such a context.



The potential limitations of the search string and the quality of the data used within this review obviously impacts on the strength of conclusions drawn and what can be said about the effectiveness of offender treatments for individuals with ASCs. However, until further research is completed and more robust evidence is established, the studies included and methods used within this review were considered the best fit for what is available.

### **Future Research and Conclusions**

The small amount of quantitative data and the uniqueness of the case reports in this review meant that, collectively, the results regarding treatment effectiveness for offenders with ASCs were not generalisable. Some of the cases did provide positive evidence of offending treatments for individuals with ASCs e.g. Radley & Shaherbano (2011) although difficulties were still highlighted. For example, in the SOTSEC-ID papers those with ASCs displayed higher recidivism rates, however the programme was still completed by these individuals and significant improvements were shown in some of the pre- and post- measures. Other studies referred to the lack of progress made by individuals with ASCs who engaged with treatment or where treatment was removed because it was felt inappropriate (e.g. Milton et al., 2002; Murphy, 2010a). Existing articles on ASCs and offending discussed the potential for the clinical features of ASCs to provide barriers to effectiveness of treatment (e.g. Griffin-Shelley, 2010; Murphy, 2010b; Higgs & Carter, 2015). Unfortunately, none of the studies included within this review examined severity of autistic features and whether those further along the spectrum experienced more intractable problems. The variability of findings could therefore be reflective of the heterogeneity of offenders with ASCs and individual responsiveness to treatment.

The findings in this review emphasise the need for larger experimental trials of treatment that would provide further evidence of effectiveness; particularly, designs with a control or treatment-as-usual group.

Future research could also be directed towards exploring the impact of ASC features on offender treatment programmes and examining the domains of empathy, thought rigidity and social and communication difficulties, making comparisons not only between individuals with ASCs who display criminal behaviours to those who do not, but also to offenders without autistic features and behaviours, something of which there was very little within the studies within this review.

A study at the Tizard Centre, University of Kent is currently undertaking some of this work, exploring the potential impact of the features of ASCs on treatment outcomes (Melvin, Murphy & Langdon, 2016). Additionally, research funded by the National Institute for Health Research (Langdon, 2016; <http://www.hra.nhs.uk/news/research-summaries/the-match-study/>), has led to the development of a typology for individuals with ASCs in forensic mental health settings, highlighting and the heterogeneity within this group and implications for treatment and responsivity (Alexander, Langdon, Chester et al., 2016).

This systematic review therefore joins a growing body of literature concerning offender treatments for individuals with ASCs; it emphasises the need for further research, particularly as treatment outcomes are influential in determining care pathways, parole and social re-integration.

Anecdotal evidence, a number of case studies and a very small amount of quantitative research appeared to be the current evidence-base for the effectiveness of offender treatments for individuals diagnosed with ASCs. The recognition and stipulation of the need for

support specific to individuals with ASCs in social policy is greatly to be welcomed, however the evidence base for establishing best-practice and service provision requirements is in its infancy. Changes to social policy in the UK such as *Think Autism* (DoH, 2014) and associated statutory guidance to implement such changes (DoH, 2015), mean a greater demand on local authorities and health services to identify and provide specific support and care pathways for individuals diagnosed with ASCs, however most studies in this review recognised the challenges in treating offenders with ASCs due to the lack of availability of ASC-specific interventions and the inappropriateness of some current treatments.

Accepted

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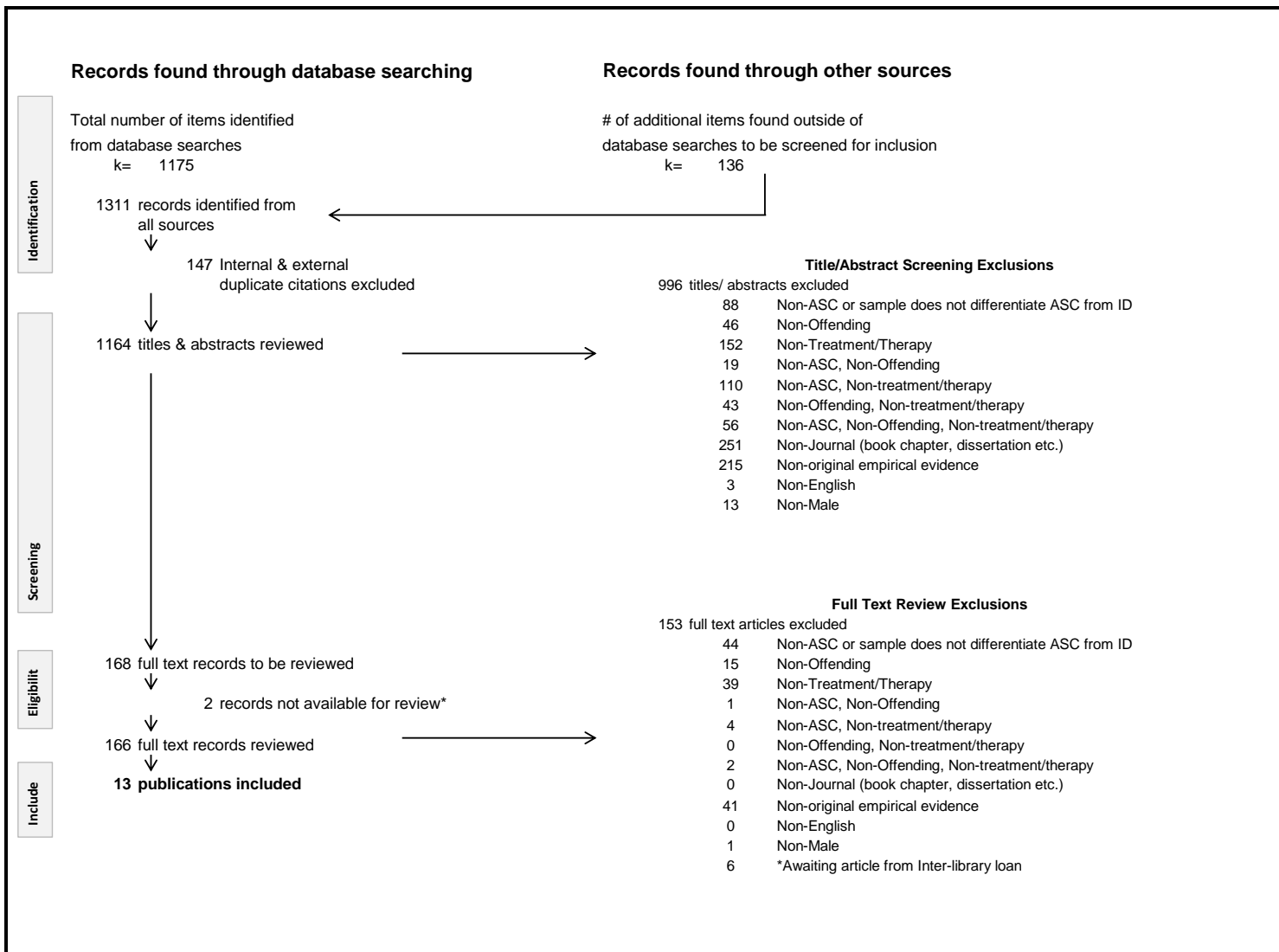
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# Flowchart of the Screening and Eligibility Evaluation Phases

This flowchart has been modeled after: Moher D, Liberati A, Tetzlaff J, Altman DG, PRISMA G. Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. Ann Intern Med. 2009;151:264-269.



**Table 1: Quantitative studies included in review**

Author	Study Population	Description & Methodology	Findings	Quality Appraisal	
				Study Classification	MMAT Rating
<i>Quantitative Studies:</i>					
<b>Murphy, Powell, Guzman &amp; Hayes (2007)</b> <b>Cognitive behavioural treatment for men with intellectual disabilities (ID) and sexually abusive behaviour: a pilot study.</b>	N=8 (4 = ASC diagnosis)  Men with ID who display sexually abusive behaviour recruited from two London boroughs community learning disability teams.	Pilot study of adapted cognitive behavioural treatment programme for men with ID who are at risk of displaying harmful sexual behaviour.  Describes intervention provided and results regarding changes in the process measures and recidivism rates for pre-and post-group.  Completion of four process measures looking at sexual attitudes and knowledge, empathy and cognitive distortions.  Wilcoxon Z tests use to analyses process measures.	Significant positive changes shown in sexual knowledge and victim empathy.  Cognitive distortions showed significant change on the <i>Questionnaire on Attitudes Consistent with Sexual Offending</i> (QACSO) (Broxholme & Lindsay, 2003; Lindsay et al., 2006) but not the <i>Sex Offender's Self-Appraisal Scale</i> (SOSAS) (Bray & Forshaw, 1996).  Some recidivism occurred (n=3). All recidivists had a previous diagnosis of ASC.	Quantitative Descriptive –Case Series	4*
<b>SOTSEC-ID (2010)</b> <b>Effectiveness of Group cognitive behavioural treatment for men with ID at risk of sexual offending.</b>	N= 46  (21% with ASC diagnosis.  57% required by law to complete treatment).	National trial of adapted cognitive behavioural treatment sex offender treatment programme for men with ID (including a number with ASC).  Completion of four process measures pre- and post- treatment looking at sexual attitudes and knowledge, empathy and	Significant changes in sexual knowledge, victim empathy and cognitive distortions between pre- and post-group timepoints.  Changes in sexual knowledge and one cognitive distortions measure (QACSO, Broxholme & Lindsay, 2003; Lindsay et	Quantitative Descriptive – Case Series	4*

NOTE. MMAT = Mixed Methods Appraisal Tool (Pluye et al., 2011)

Author	Study Population	Description & Methodology	Findings	Quality Appraisal	
				Study Classification	MMAT Rating
<i>Quantitative Studies:</i>					
	National study of men with ID who display sexually abusive behaviour.	<p>cognitive distortions.</p> <p>Parametric analysis used to look at victim empathy and cognitive distortions.</p> <p>Non-parametric analysis used to look at Sexual attitudes and knowledge (non-normal distribution of data).</p>	<p>al., 2006) still significant at six-month follow-up.</p> <p>Few men showed further sexually abusive behaviour in follow up period since treatment completion (n=4).</p> <p>Increased risk of recidivism was associated with diagnosis of ASC (although interpreted with caution due to low n).</p>		
<b>Heaton &amp; Murphy (2013) Men with ID who have attend SOTSEC-ID Groups: A follow up.</b>	<p>N=34 (from seven treatment sites.</p> <p>21% with ASC diagnosis.</p> <p>Mean length of follow up = 44months, (SD = 28.7, range = 15-106 months)</p> <p>Adult men with ID who display sexually abusive</p>	<p>Follow up of 34 of the original 46 men from the SOTSEC-ID programme.</p> <p>Reported on changes in process measures and recidivism rates.</p> <p>Completion of four process measures looking at sexual attitudes and knowledge, empathy and cognitive distortions.</p> <p>Friedman tests used to compare pre/post/follow-up process measures</p> <p>Wilcoxon ranks tests use to analyse significant findings.</p> <p>Discussed longer-term implications and effectiveness of adapted sex offender</p>	<p>Significant increases shown in sexual attitudes and knowledge across pre/post and follow up periods.</p> <p>Significant changes in victim empathy scores between pre- and post- group, and between pre-group and follow up. Changes between post-group and follow-up were non-significant.</p> <p>The SOSAS (Bray &amp; Forshaw, 1996) showed no significant changes in cognitive distortions across timepoints, however changes in QACSO (Broxholme &amp; Lindsay, 2003; Lindsay et al., 2006) scores were significant between pre-</p>	Quantitative Descriptive – Case Series	4*

Author	Study Population	Description & Methodology	Findings	Quality Appraisal	
				Study Classification	MMAT Rating
<i>Quantitative Studies:</i>					
	behaviour and completed an adapted SOTP.	treatment programmes for men with intellectual disability, including those with ASC.	and post-group, and pre-group and follow up.  No non-sexual offences occurred during the follow up, however 11 of the 34 men (32%) engaged in further harmful sexual behaviour.  ASC was found to be a variable associated with further sexually abusive behaviour.		
<b>Langdon, Murphy, Clare et al. (2013) An Evaluation of the EQUIP treatment programme with men who have intellectual or other developmental disabilities (IDD).</b>	N=7 (ID=3; Asperger's syndrome=4).  Adult males with IDD detained in a medium-secure forensic unit for people with ID.	Pilot of an adapted version of the Equipping Youth to Help One Another (EQUIP) programme with men with IDD in a medium secure forensic unit.  Treatment programme designed to enhance moral development and address cognitive distortions.  Delivered over 12 weeks, with x4 1hour sessions per week.	Results suggest treatment was successful in increasing moral reasoning ability, reducing cognitive distortions and improving ability in choosing effective solutions to problems.  Treatment did not show any significant impact upon anger.  3 of the men with AS who were likely to have difficulties with social perspective taking reported to have appeared to benefit from this intervention.	Quantitative Descriptive – Case Series	4*

**Table 2 Qualitative studies included in review:**

Author	Study Population	Description & Methodology	Findings	Quality Appraisal	
				Study Classification	MMAT Score
<i>Qualitative Studies:</i>					
<b>Griffin-Shelley (2010) An Asperger's adolescent sex addict, sex offender: A case study.</b>	N=1 Adolescent male with Asperger's syndrome and diagnosed with sex addiction.	Case report of an adolescent with Asperger's syndrome who displayed sexual addiction and sexual offending behaviours.  Narrative case study covering psychological testing and assessment, initial treatment, residential treatment, aftercare and ongoing issues for the individual.  Treatment approaches used: group therapy, psycho-education and relapse prevention.	Recidivism behaviours displayed, although possible reductions in frequency and severity.  Author presents clinical opinion on treatment outcomes, potential influencing factors on offending and wider implications.  Suggested alternative use of addiction rather than offending model for treatment of individual with Asperger's syndrome and sexual addiction.	Qualitative - Case Study	3*
<b>Kohn, Fahum, Ratzoni and Apter (1998) Aggression and sexual offence in Asperger's syndrome.</b>	N=1 16-year-old male diagnosed with Asperger's syndrome referred to psychiatric services following a series of violent and sexual assaults.	Literature review and narrative case report of an individual with Asperger syndrome highlighting an atypical case of aggression and sexual offence in an individual with Asperger's syndrome.  Data includes background, history of behaviours and offending, treatment and outcomes.  Discussion of wider implications for ASCs and offending.  Treatments utilised include: psychotherapy, family therapy, drug treatment and social skills programmes.	Author presents clinical opinions on impact of Asperger's syndrome in offending and the role of theory of mind deficits.  Recidivism reported but with few positive effects of therapy identified.  Author discusses low prevalence rates reported in literature and highlights needs for more research.	Qualitative - Case Study	2*

Author	Study Population	Description & Methodology	Findings	Quality Appraisal	
				Study Classification	MMAT Score
<i>Qualitative Studies:</i>					
<b>Milton, Duggan, Latham, Egan &amp; Tantum. (2002) Case history of co-morbid Asperger's Syndrome and paraphilic behaviour.</b>	N=1 Adult male with Asperger's syndrome who displayed paraphilic behaviour and has convictions for sexual offences detained under the Mental Health Act (1983).	<p>Case study of individual with Asperger's syndrome who displays paraphilic behaviours and has convictions for sexual offending.</p> <p>Background and history of offending is presented, along with outcomes of clinical evaluation and management.</p> <p>Individual placed in residential rehabilitation programme for individuals with personality disorder. Reports on assessment of service use and issues of late diagnosis, treatment and risk.</p> <p>Behaviours rated using the Behavioural Status Index (BSI; Reed <i>et al.</i>, 1996)</p> <p>Discussion of wider implications for ASCs and offending and the impact of diagnosis on treatment outcomes resulting in potential lengthy periods in institutional care.</p> <p>Wider applications of issues discussed for cases of offenders with ASC and/or displaying problem behaviours.</p>	<p>Authors discuss treatment offered to individual at facility for those with personality disorder.</p> <p>Described use of pharmacological treatments with little impact on sexual behaviours and negative side effects e.g. facial tics.</p> <p>Authors refer to some of the difficulties the individual experienced with aspects of the treatment programme, including group therapy.</p> <p>Authors recommend alternative treatment centre (ASC specialist, not Personality Disorder) and discuss implications for individuals with ASC in inappropriate treatment units, including length of stay.</p>	Qualitative - Case Study	2*
<b>Murphy (2010a) Extreme violence in a man with an autistic spectrum disorder: assessment and treatment within high-security psychiatric care.</b>	N=1 Adult male with Asperger's syndrome convicted of manslaughter detained in high-security psychiatric	<p>Case report detailing assessment, offence formulation and psychological treatments offered including adapted cognitive behavioural therapy, skills development (emotion recognition and problem solving) and psycho-education.</p> <p>Additionally, author also refers to work directed at improving difficulties in recognising and understanding consequences, victim empathy and managing interpersonal conflict.</p> <p>Also discusses mental capacity, risk assessments and future</p>	<p>Reference to changes in assessment measures e.g. reductions in <i>state</i> anger on STAXI-II (Speilberger, 1999) following individual therapy but no changes in expression of anger.</p> <p>Acknowledges difficulty in quantifying any change and refers to the cognitive rigidity of the individual regarding</p>	Qualitative - Case Study	2*



Author	Study Population	Description & Methodology	Findings	Quality Appraisal	
				Study Classification	MMAT Score
<i>Qualitative Studies:</i>					
	care.	management, plus the role of high-secure psychiatric care for offenders with ASCs who commit serious offences.	their perspective of the offence despite over seventy hours of individual contact.		
<b>Radley and Shaherbano (2011) Asperger syndrome and arson.</b>	N=1 Young male (24yrs) with Asperger's syndrome convicted of committing arson, detained under Mental Health Act (1983) with co-morbid mental health problems and substance misuse.	Narrative case study covering history, offence, progress in hospital, assessment and diagnosis of ASC, treatment programme, outcomes and progression.  Treatments included: anti-psychotic medication, psychoeducation, Speech and Language Therapy and Substance Misuse Treatment Programme.  Also received individual therapy addressing substance misuse and fire-setting behaviours.  Discussion of the role of ASC in the offence and the potential impact of late diagnosis.	Following early increase in psychotic symptoms, paranoia and aggression after admission, author reports on:  <ul style="list-style-type: none"> <li>• understanding of offence cycle and need for relapse prevention</li> <li>• reduction in aggressive behaviour</li> <li>• acceptance of medication and ASC diagnosis</li> <li>• reduction in psychotic symptoms</li> <li>• recommendations for care pathway including discharge to less secure service, followed by community reintegration.</li> </ul>	Qualitative - Case Study	1*
<b>Kelbrick and Radley (2013) Forensic rehabilitation in Asperger's syndrome: a case report.</b>	N=1 26-year-old male with Asperger's syndrome admitted to hospital following multiple counts of assault, including actual	Case report of individual with Asperger's syndrome and co-morbid psychosis who displayed offending behaviour.  Authors review literature relating to Asperger's syndrome and offending and co-morbidity.  Reported case history and index offence, and describes rehabilitation process for both mental health problems and offending behaviours.	Case reports on:  <ul style="list-style-type: none"> <li>• Stabilisation of mental health symptoms resulting in engagement in the therapeutic programme and other activities and leading to transfer to a step-down locked rehabilitation unit.</li> </ul>	Qualitative - Case Study	1*

Author	Study Population	Description & Methodology	Findings	Quality Appraisal	
				Study Classification	MMAT Score
<i>Qualitative Studies:</i>					
	bodily harm.	<p>Treatment referred to includes: medication (for mental health issues), social skills training, cognitive behavioural therapy group work and relationship focused work, individual cognitive analytical therapy (CAT) and relapse prevention work.</p> <p>Also included occupational therapy programme and community leave.</p> <p>Report includes data from the patient's perspective of having Asperger's syndrome and of the rehabilitation process.</p>	<ul style="list-style-type: none"> <li>Subsequent collaboration with fellow patient and re-offended, assaulting a female staff member and transferred back to low-secure unit.</li> </ul> <p>No further risk related behaviours displayed since returning to low-secure and planned transfer to a specialist ASC residential home.</p> <p>Reported to have <i>"developed a good understanding of his diagnosis, reasons for his offending and has engaged well in relapse prevention work"</i> (p62).</p> <p>Also utilises CAT maps.</p>		
<b>Ray, Marks and Bray-Garretson (2004)</b> <b>Challenges to treating adolescents with Asperger's syndrome who are sexually abusive.</b>	N=4 Adolescent males (age 14-17years) with Asperger's syndrome and Pervasive Development Disorder (PDD) seen at the authors' practice for a range of sexual, anti-	<p>Discusses challenges to treating adolescents with autism, Asperger's syndrome and PDD who are sexually abusive and uses four case examples to illustrate.</p> <p>Describes background and behaviours of four cases and gives detail on treatment approaches for two cases involving an individual who exhibited sexually coercive behaviour towards young children, and another who displays sexually inappropriate behaviours including sexualised and/or violent states and gestures.</p> <p>For one case treatment focused on <i>"expanding awareness of</i></p>	<p>Some positive outcomes reported although recidivism is displayed in the two cases describing treatment.</p> <p>Report improvements in:</p> <ul style="list-style-type: none"> <li>awareness of need for management strategies</li> <li>flexibility and willingness to try new things</li> <li>stabilisation of behaviour</li> <li>emotion regulation</li> </ul>	Qualitative - Case Study	0*

Author	Study Population	Description & Methodology	Findings	Quality Appraisal	
				Study Classification	MMAT Score
<i>Qualitative Studies:</i>					
	social and paraphilic behaviours.	<i>and make room for new experiences"</i> (p272). The second case describing treatment refers to helping the individual to <i>"develop a language for describing the internal compulsions that drive his inappropriate behaviours"</i> (p275).	Authors make recommendations and suggestions for treating adolescents with AS and PDD who are sexually abusive.		
<b>Chan and Saluja (2011)</b> <b>Sexual offending and improvement in autistic characteristics after acquired brain injury.</b>	N=1 Young male with autistic spectrum disorder convicted of sexual offending.	Case report of young man (in his twenties) with autism who displayed sexually abusive behaviours and also exhibited improvements in core symptomatology following a traumatic brain injury (TBI). Data includes background, history of behaviours and offending (including mention of attending a sex offender programme for psychological treatment), and details surrounding the traumatic brain injury and after effects.	Improvements reported in autistic characteristics following brain injury, specifically social interaction, <i>"he became chatty and sociable, more spontaneous to converse and more verbose"</i> (p902) No impact on sexual offending behaviours (presented before TBI) reported with recidivism continuing following treatment and post-TBI.	Qualitative - Case Study	0*
<b>Faccini (2014)</b> <b>Reconstructive Therapy of a Serial Threatener with Autism</b>	N=1 Man with autism who has a life long history of making impersonal threats and arson.	Continued case study of a male with autism who has a long history of hoax calling (bomb threats/assassination attempts) and arson. Treatment for autism, psychopathology and Eriksonian deficits. Utilised reconstructive therapy and identity work from an offending treatment programme to address deficits and create new identity. Also included trauma therapy and work on social skills.	Author determined treatment programme was effective in remediating Eriksonian deficits and creating a new identity. Also proposed that resolution of the deficits may <i>"decrease static risk and function as a dynamic protective factor"</i> (p31). No reference to recidivism.	Qualitative - Case Study	1*

**Table 3: Qualitative themes from case studies included in review**

Authors	Themes											
	ASC Diagnosis	Co-morbid mental health diagnosis?	Offending behaviour	Early onset or previous offending behaviours?	Substance use?	Medication for offending behaviour?	Implied or discusses role of ASC on offending?	Offending treatment approach	Suggested influence of ASC on treatment?	Treatment deemed 'effective'?	Evidence of further behaviours?	Evidence of 'implicit' improvements?
Griffin-Shelley (2010)	AS	Y	Sexual	Y	-	-	Y – special interest, empathy difficulties, social difficulties, empathy	Psycho-education, individual and group psychotherapy, Family therapy and relapse prevention	Y – difficulties with empathy and perspective taking, social difficulties	N Evidence of reduction in some behaviours	Y	Y
Kohn, Fahum, Ratzoni & Apter (1998)	AS	N	Sexual Aggression Theft	Y	-	Y	Y – impaired theory of mind and social relatedness	Varied, including family therapy, psychotherapy and social skills training	-	N	Y	-
Milton Duggan, Latham, Egan & Tantum (2002)	AS	N - but displays 'obsessional traits'	Sexual	Y	-	Y	Y – special interest	Adapted PD treatment programme	Y – group work omitted due to difficulties	N	Y	N
Murphy (2010a)	AS	Y	Manslaughter	Y	N	N	Y – difficulties in communication and information processing, difficulties with perspective taking and empathy, and problems	Adapted CBT	Y – cognitive rigidity, empathy, ability to generalise information or adapt to context, difficulties with	N	N (but difficult to assess in unit)	N

NOTE. 'Implicit' improvements = improvements other than the offending behaviour e.g. social skills development, improved emotion regulation or recognition, and increased understanding of mental health diagnoses; ASC = autism spectrum condition or disorder; AS = Asperger's syndrome; PDD = pervasive developmental disorder; PD = personality disorder; CBT = cognitive behavioural therapy; CAT = cognitive analytical therapy.

Authors	Themes											
	ASC Diagnosis	Co-morbid mental health diagnosis?	Offending behaviour	Early onset or previous offending behaviours?	Substance use?	Medication for offending behaviour?	Implied or discusses role of ASC on offending?	Offending treatment approach	Suggested influence of ASC on treatment?	Treatment deemed 'effective'?	Evidence of further behaviours?	Evidence of 'implicit' improvements?
							predicting or understanding consequences of own actions.		group work			
Radley & Shaherbano (2011)	ASC	Y	Arson	Y	Y	Y – but unclear if medication for psychotic symptoms or aggressive behaviours	Y – special interests, impaired social skills	Not specified	Y – individual work as result of difficulties with group work	Y	N	Y
Kelbrick & Radley (2013)	AS	Y	Aggression Sexual	Y	N	N	Y – impaired social skills and difficulties with social perspective taking	CBT, CAT, Individual and Group work	-		N	Y
Ray, Marks & Bray-Garretson (2004)	AS (n=3), PDD (n=1)	Y	Aggression Sexual	Y	-	-	Y – special interests, inflexible thinking style, empathy difficulties, poor emotion recognition and regulation	Varied	-	Y some example of improvement	Y	Y
Chan & Saluja (2011)	Autism	-	Sexual	Y	-	-	Y – special interest	Not specified	-	-	Y	-
Faccini (2014)	Autism	Y	Impersonal Threats Arson	Y	-	-	Y – special interests, social difficulties	Reconstructive Therapy	(mentioned in Faccini, 2010)	Y	-	Y