A systematic PRISMA review of individuals with autism spectrum disorder in secure psychiatric care: prevalence, treatment, risk assessment and other clinical considerations

Allely, CS

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A Systematic PRISMA Review of Individuals with Autism Spectrum Disorder in Secure Psychiatric Care: Prevalence, Treatment, Risk Assessment and Other Clinical Considerations.

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Overall feedback

I want to thank the reviewers for their positive comments on my manuscript.

Reviewer: 1

Recommendation: Minor Revision

Comment 1. <b>2. Relationship to Literature: </b> Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored?: This is a very comprehensive review of the literature. Only comment is that the most of the evidence presented was from the UK and would be helpful for the author or authors to clarify if any literature was identified around forensic inpatient or secure services outside the UK on adults with ASD.

Response: Yes, I can confirm that most of the literature in this field is from the UK (thanks, in particular to David Murphy’s work in Broadmoor). In the systematic review search, no restrictions were put in place regarding the country the study was conducted in.

Comment 2: <b>3. Methodology: </b> Is the paper's argument built on an appropriate base of theory, concepts, or other ideas? Has the research or equivalent intellectual work on which the paper is based been well designed? Are the methods employed appropriate?: The methodology is appropriate. The only issue is why a search term of 'forensic hospitals' was not used as the search seemed to focus mostly on the term 'secure' in-patient settings.

Response: This is a good point raised by the reviewer. However, this is one of the reasons that I conducted a thorough search on google scholar using a variety of search criteria which also included terms like ‘forensic’, etc. Any relevant papers would have been identified at this stage. Searches were also made of each of the papers reference sections which were returned in the databases searches for any papers which may have been missed.

Comment 3: Also more of an explanation why only focused on adults with ASD and excluded those with ID. Need to put a statement in the introduction on the rates of overlap of ASD with ID.

Response: This is an important issue to address. I have added the following to the introduction section:

“Intellectual disability (ID) and ASD are the most common developmental disorders and “combined, they affect between 3-5% of the population” (Srivastava & Schwartz, 2014, pp.161). Postorino and
colleagues (2016), in a recent paper investigating the prevalence of ID and ASD in an Italian sample of children and adolescents, cited a number of studies which have found that there is a frequent co-
ocurrence between ID and ASD, and that both these disorders have been argued to share genetic substrates (e.g., Bolte & Poustka, 2002; Bonora et al., 2014; Charman et al., 2011; Deth, 2012; Fombonne, 2003, 2009; Mefford, Batshaw, & Hoffman, 2012; Nicholl et al., 2014; Srivastava & Schwartz, 2014). Srivastava and Schwartz (2014) also suggest that these two disorders are significantly likely to be associated both biochemically and molecularly. Studies have found that as many as 70% of individuals with ASDs have some level of ID while the other 30% have some form of disability (e.g., speech, behavior) which is not cognitive dysfunction (Mefford et al., 2012; Newschaffer et al., 2007; Wilkins & Matson, 2009). However, it is interesting to note studies which have looked at this from the other perspective – the prevalence of ASD in individuals with ID. About 10% of individuals with ID have ASDs. Additionally, some ID conditions have been found to have a greater prevalence of co-occurrence with ASD than others (Srivastava & Schwartz, 2014).

However, Postorino and colleagues (2016) have argued that the studies published to date have reported a wide range of rates of ID prevalence in ASD – with reported prevalence ranging from 16.7% to 84% (Baird et al., 2000, 2006; Bertrand et al., 2001; Bolte & Poustka, 2002; Bolte, Dziobek, & Poustka, 2009; Carlsson et al., 2013; Centers for Disease Control and Prevention, 2014; Chakrabarti & Fombonne, 2005; Charman et al., 2011; De Bildt, Sytema, Kraijer, & Minderaa, 2004; Fombonne, 2003; Gillberg, Steffenburg, & Schaumann, 1991; Keen & Ward, 2004; La Malfa, Lassi, Bertelli, Salvini, & Placidi, 2004; Magnússon & Saemundsen, 2001; Matson & Shoemaker, 2009; Miller et al., 2012; Oliveira et al., 2007). The majority of these studies main research focus, however, was examining the epidemiology of ASD rather than specifically investigating the rate of comorbidity of ID in individuals with ASD (Postorino, Fatta, Sanges, Giovagnoli, De Peppo, Vicari, & Mazzone, 2016). Despite the well-established high co-morbidity between ID and ASD, the present paper focuses on studies which specifically look at individuals with ASD because there has been relatively little research investigating ASD in the criminal justice system. However, there is a significant amount of research which has looked at ID in the criminal justice system (e.g., Ali, Ghosh, Strydom, & Hassiotis, 2016; Boer et al., 2016; Cootes, 2016; Eadens, Cranston-Gingras, Dupoux, & Eadens, 2016; Murphy, Gardner, & Freeman, 2017; Murphy, Chiu, Triantafyllopoulou, Barnoux, Blake et al., 2017). This study is interested in the particular experiences of individuals with ASD given their unique features, challenges and needs”.

References added:


Comment 4: <b>4. Results: </b> Are results presented clearly and analysed appropriately? Do the conclusions adequately tie together the other elements of the paper? The results are clearly presented although a summary table of the 12 identified papers would have been helpful.

Response: I gave this reviewer comment some thought as I am personal a big fan of the Table. However, for this particular paper I decided against a table given that there were only 12 papers. These studies were reviewed using the following six categories: prevalence of ASD in secure psychiatric hospitals; evaluating the clinical utility of the AQ screening tool to assess self-reported autistic traits in secure psychiatric settings; characteristics of patients with ASD detained in secure psychiatric hospitals; experiences and quality of life of patients with an ASD detained in secure psychiatric care; awareness and views of ASD held by staff working within a secure psychiatric hospital and interventions/treatment outcomes with patients with ASD in secure psychiatric hospitals.

Given the number of categories used to organise the reporting of the findings, a table was felt not to be essential.

Comment 5: <b>5. Practicality and/or Research implications: </b> Does the paper identify clearly any implications for practice and/or further research? Are these implications consistent with the findings and conclusions of the paper? The research implications are discussed in depth but not sure the authors make it clear what practitioners in non-specialist secure services should do differently on a day to day basis when they identify a patient with ASD on reading this paper.

Response: The reviewer raises a very important question and something that does require attention. However, this is outside the scope of the review and my expertise. I would not want to comment on this without first-hand knowledge.

Comment 6: <b>6. Quality of Communication: </b> Does the paper clearly express its case, measured against the technical language of the field and the expected knowledge of the journal’s readership? Has attention been paid to the clarity of expression and readability, such as sentence structure, jargon use, acronyms, etc?: This is a clearly written paper. May be recheck for typo errors e.g page 17, line 55 use 'AD' instead of 'ASD'.

Response: I thank the reviewer for spotting these errors. I have now corrected them and carried out a thorough proof read.

Reviewer: 2

Recommendation: Minor Revision

Comment 1: <b>3. Methodology: </b> Is the paper's argument built on an appropriate base of theory, concepts, or other ideas? Has the research or equivalent intellectual work on which the paper is based been well designed? Are the methods employed appropriate?:

Although the question is implicit in the title, it is not in the main body of the text. This has impact later on when clinical considerations are discussed. Although in aims of the review the main areas that are to be reported on are given, there are some areas prominent in the study which are not
stated e.g. in this part there is no reference to screening an issue that rightly plays a prominent part when critiquing the available studies.

**Response:** I am not entirely clear about the advice the reviewer is suggesting here.

There was only one study identified in the review which looked at screening based on the inclusion criteria set out in the review. This paper is discussed under the subheading: “Evaluating the clinical utility of the AQ screening tool to assess self-reported autistic traits in secure psychiatric settings” in the results section.

Given the important of screening in this area (as highlighted by the reviewer), the following section was added:

“Screening for ASD: The clinical utility of the AQ with forensic psychiatric patients

A recent study identified and described a number of screening tools for ASD that can support clinicians or researchers in trying to determine whether a more comprehensive ASD assessment is warranted (Sappok, Heinrich, & Underwood, 2015). Interestingly, only one study was identified in the present review which investigated the clinical utility of an ASD screening tool in forensic psychiatric patients with ASD (Murphy, 2011). In his paper, Murphy (2011) highlighted the urgent need for a forensic version of the AQ. Despite the clinical utility of the AQ in assessing the presence of ASD among patients admitted to high security psychiatric care, there are significant issues related with symptom validity (which are common to all self-report instruments). Importantly, the use of the AQ may be limited only to those individuals with sufficient literacy skills. There have been a number of studies which have found ‘extremely poor literacy skills’ in prisoners, for instance (e.g., Creese, 2016). Given the well-established high rate of patients and prisoners with poor literacy skills, Murphy (2011) recommends the need for an adapted version of the AQ which could be conducted using a semi-structured interview approach.

McCarthy and colleagues (2015) have also highlighted a number of studies which reported limitations on using the AQ as a diagnostic screen rather than as a tool to identify specific traits of autism (e.g., Hoekstra, Bartels, Cath, & Boomsma, 2008, Sizoo, van den Brink, Gorissen-van Eenige, Koeter, van Wijngaarden-Cremers, & van der Gaag, 2009). Another important issue with the currently employed screening tools are their cultural sensitivity, particularly within a forensic setting such as a prison. In a study carried out by McCarthy and colleagues (2015), their findings indicated that prisoners from black or minority ethnicity (BME) backgrounds were at increased risk of their neurodevelopmental disorders and difficulties (NDD) symptoms going unrecognised by the current screening instruments. McCarthy and colleagues found that screening methods in their study identified “more white prisoners with NDD than was representative of the broader prison population, despite a lack of sampling or referral bias” (McCarthy et al., 2015). This is consistent with the findings from other studies (e.g., Fazio et al., 2012).

**References added:**


The paragraph below was initially in the discussion section. However, it has now been moved to the conclusion section to highlight the importance of more work needed in this area:

“As highlighted by Murphy (2011), poor literacy skills are common in many prisoners and patients which necessitates the need to adapt the currently used AQ, perhaps enabling the tool to be delivered in a semi-structured interview. One common issue which arose during the use of the AQ with the patients with ASD was the difficulty that many had in deciding on one answer. Moreover, some items in the AQ are difficult for many individuals to directly relate to (Murphy, 2011). There is also a growing concern over the clinical utility of the AQ and not just in forensic settings (e.g., Ashwood et al., 2016). This suggests the need for the development of an ASD screening tool for use in forensic settings and one for use in community settings”.

Comment 2: <b>5. Practicality and/or Research implications: </b>Does the paper identify clearly any implications for practice and/or further research? Are these implications consistent with the findings and conclusions of the paper?: Research implications are covered. Although it says there is a need to look at effects of treatment outcomes, what the outcomes are are not stated e.g., reoffending, QoL, LoS or are there other outcomes we should be concentrating on not previously considered as evidence of treatment success or patient satisfaction.

Response: The reviewer raises an important point here.

I have added the following to the research implications section:

“Treatment outcomes would include: improvements in clinical symptoms and behaviour; quality of life (QoL); patient experience of care (e.g. satisfaction); length of hospital stay; the use of ‘reactive’ or ‘restrictive’ interventions (for instance, the use of physical interventions and seclusion, pro re nata (PRN) medication or a change in observations levels) and re-offending and risk (these are some of the treatment outcomes that have been used in a number of studies, e.g., Morrissey et a., 2017)”.
References added:


[End of response to reviewer comments]
A Systematic PRISMA Review of Individuals with Autism Spectrum Disorder in Secure Psychiatric Care:
Prevalence, Treatment, Risk Assessment and Other Clinical Considerations
Abstract

**Purpose** Patients with *autism spectrum disorder (ASD)* present with specific assessment, specific difficulties, needs and therapeutic issues and therefore are a challenging group for forensic services. Given the challenge that individuals with ASD present to forensic services, the suggested increase in the number of this group within this setting and the relatively little amount of research which suggests they face a number of difficulties within the prison environment, the present review will investigate what identify and review all the studies which have been carried out investigating any aspect of ASD in relation to secure hospital settings.

**Methodology** Seven internet-based bibliographic databases were used for the present review. The review followed the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) guidelines.

**Findings** Twelve studies were included in this review. Three looked at the prevalence of ASD in secure psychiatric hospitals. One study evaluated the clinical utility of the AQ screening tool to assess self-reported autistic traits in secure psychiatric settings. Three explored any type of characteristics of patients with ASD detained in secure psychiatric hospitals. One study investigated the experiences or quality of life of patients with an ASD detained in secure psychiatric care. Two studies investigated awareness, knowledge and/or views regarding patients with ASD held by staff working within secure psychiatric hospitals. Lastly, three studies (one of which was also included in the prevalence category above) looked at the effectiveness of interventions or treatment of patients with ASD in secure psychiatric hospitals. Clinical recommendations and future research directions are discussed.

**Originality** To the author’s knowledge, this is the first review to explore what research has been carried out looking specifically at patients with ASD in relation to secure forensic settings.

**Keywords:** Autism Spectrum Disorder; Asperger’s syndrome; High Secure Psychiatric Hospital; HSPC; Secure Hospital; Secure Forensic Settings.
Autism Spectrum Disorders (ASDs) are neurodevelopmental disorders characterised by impairments in social reciprocal interactions and communication and restricted, repetitive pattern of interests and behaviour (American Psychiatric Association (APA), 2000, 2013). The “true” prevalence of ASD is not known (Fernell, Eriksson, & Gillberg, 2012). As highlighted by Lyall and colleagues (2017) in a recent paper, only one rigorous study of ASD prevalence in adults has been conducted to date (Brugha et al., 2011). This investigation, conducted in England in 2007, actively sampled adults from the community and it employed an active two-stage screening-confirmation approach which produced an estimate of ASD in 1% in the general population. This prevalence is consistent with the findings from some other studies (e.g., Simonoff, 2012). The male–female ratio for ASD prevalence is between 4 and 5:1 in the general population (Fombonne, 2009). The Diagnostic Statistical Manual fifth edition’s (DSM-V, American Psychiatric Association, APA, 2013) now defines two core areas of impairment in ASD (previously three core areas) (1) “persistent deficits in social communication and social interaction” and (2) “restricted, repetitive patterns of behavior, interests, or activities” (APA, 2013). Impairment to these two core areas varies across individuals in terms of symptoms and levels of severity. There has been much criticism over the proposed changes and final changes made in the DSM-V’s new criteria for ASD (see Waterhouse, 2013; Wing, Gould, & Gillberg, 2011; McPartland, Reichow, & Volkmar, 2012; Ritvo, 2012; Fernell et al., 2012). However, a thorough discussion of this is outside the scope of this review.

Rates of Overlap between Intellectual Disability and ASD

Intellectual disability (ID) and ASD are the most common developmental disorders and “combined, they affect between 3-5% of the population” (Srivastava & Schwartz, 2014, pp.161). Postorino and colleagues (2016), in a recent paper investigating the prevalence of ID and ASD in an Italian sample of children and adolescents, cited a number of studies which have found that there is a frequent co-occurrence between ID and ASD, and that both these disorders have been argued to share genetic substrates (e.g., Bolte & Poustka, 2002; Bonora et al., 2014; Charman et al., 2011; Deth, 2012; Fombonne, 2003, 2009; Mefford, Batshaw, & Hoffman, 2012; Nicholl et al., 2014; Srivastava & Schwartz, 2014). Srivastava and Schwartz (2014) also suggest that these two disorders are significantly likely to be associated both biochemically and molecularly. Studies have found that as many as 70% of individuals with ASDs have some level of ID while the other 30% have some form of disability (e.g., speech, behavior) which is not cognitive dysfunction (Mefford et al., 2012; Newschaffer et al., 2007; Wilkins & Matson, 2009). However, it is interesting to note studies which have looked at this from the other perspective – the prevalence of ASD in individuals with ID. About 10% of individuals with ID have ASDs. Additionally, some ID conditions have been found to have a greater prevalence of co-occurrence with ASD than others (Srivastava & Schwartz, 2014).

However, Postorino and colleagues (2016) have argued that the studies published to date have reported a wide range of rates of ID prevalence in ASD – with reported prevalence ranging from 16.7% to 84% (Baird et al., 2000, 2006; Bertrand et al., 2001; Bolte & Poustka, 2002; Bolte, Dziobek, & Poustka, 2009; Carlsson et al., 2013; Centers for Disease Control and Prevention, 2014; Chakrabarti & Fombonne, 2005; Charman et al., 2011; De...
Bildt, Sytenta, Kraijer, & Minderaa, 2004; Fombonne, 2003; Gillberg, Steffenburg, & Schaumann, 1991; Keen & Ward, 2004; La Malfa, Lassi, Bertelli, Salvini, & Placidi, 2004; Magnússon & Saemundsen, 2001; Matson & Shogmaker, 2009; Miller et al., 2012; Oliveira et al., 2007). The majority of these studies main research focus, however, was examining the epidemiology of ASD rather than specifically investigating the rate of comorbidity of ID in individuals with ASD (Postorino, Fatta, Sanges, Giovagnoli, De Peppo, Vicari, & Mazzone, 2016). Despite the well-established high co-morbidity between ID and ASD, the present paper focuses on studies which specifically look at individuals with ASD because there has been relatively little research investigating ASD in the criminal justice system. However, there is a significant amount of research which has looked at ID in the criminal justice system (e.g., Ali, Ghosh, Strydom, & Hassiotis, 2016; Boer et al., 2016; Cootes, 2016; Eadens, Cranston-Gineras, Dupoux, & Eadens, 2016; Murphy, Gardner, & Freeman, 2017; Murphy, Chiu, Triantafyllopoulou, Barnoux, Blake et al., 2017). This study is interested in the particular experiences of individuals with ASD given their unique features, challenges and needs.

ASD and offending behaviour

The types of offending behaviours which have been found to be associated with offenders with ASD include: violent behaviour, sexual offending, fire setting, obsessive harassment (stalking) and computer/cyber-crimes (Ledingham & Mills, 2015; Sabet, Underwood, Chaplin, Hayward, & McCarthy, 2015; Allely & Creaby-Attwood, 2016). It is important to highlight that most individuals with ASD are law-abiding (Murphy, 2017). There is no evidence to suggest that individuals with ASD have higher rates of offending behaviour (King & Murphy, 2014). However, it is important to draw attention to the increasing body of research which indicates that it is those individuals with ASD who also have psychiatric co-morbidities who are more at risk of engaging in offending behaviour (e.g., Chaplin et al., 2013). Some of the most common co-morbidities in individuals with ASD include: mood disorders such as depression and anxiety (e.g., Ghaziuddin, Ghaziuddin, & Greden, 2002; Hammond & Hoffman, 2014; Matson & Williams, 2014; Moss, Howlin, Savage, Bolton, & Rutter, 2015; Bruggink, Huisman, Vuijk, Kraaij, & Garnefski, 2016), and behavioural disorders including attention-deficit/hyperactivity disorder (ADHD) (e.g., Chen et al., 2015; Taylor, Charman, & Ronald, 2015; Antshel, Zhang-James, Wagner, Ledesma, & Faraone, 2016). One recent longitudinal study comprising of 124 youths with a clinical diagnosis of ASD (mean age, 10.6 ± 3.3 years) found that early comorbid psychiatric conditions such as: anxiety/depression, inattention, hyperactivity/impulsivity and oppositional behaviours may also impair later social adjustment (adaptive functioning) in youths with ASD as found at follow up interviews which took place about three years later (37.59 ± 15 months) (Chiang & Gau, 2016).

ASD in the Prison Environment
While there have been numerous studies investigating the offending behaviour of individuals with ASDs, there has been very little research investigating the experience and difficulties faced by such individuals in the prison environment (Haskins & Silva, 2006; Lewis, Pritchett, Hughes, & Turner, 2015). Two recent reviews highlight the lack of research which has explored the experiences of individuals with ASD in the prison environment (Robertson & McGillivary, 2015; Allely, 2015). For inmates with ASD, numerous issues can result from the social and physical constraints of the prison environment. For individuals with ASD, the prison environment can be more challenging and distressing due to the ASD traits that can cause problems in everyday life (e.g., obsessions, compulsions, difficulties in communicating with others) (e.g., Love & Morrison, 2002; Martin, 2001; Newman, Cashin, & Waters, 2015). They may also be more vulnerable to bullying, exploitation, sexual and physical victimisation, social isolation and confrontations with other inmates (The National Autistic Society, 2005; English & Heil, 2005). Some studies have also found that having a development disability is a risk factor for encountering less empathy from correctional staff (Glaser & Deane, 1999; Shively, 2004) and for having relational difficulties with other inmates (Attwood, 1998; Gordon, 2002).

Currently, the prevalence of ASDs in prisons is not known (Robinson et al., 2012). There are a number of reasons why this figure is difficult to ascertain. The main reason was highlighted by Chaplin and McCarthy (2014) in their paper. Currently in the United Kingdom, ASD is not part of the prison screening process (Myers, 2004; Chaplin & McCarthy, 2014). A lack of suitable, ASD sensitive, assessment tools has been put forward as one possible explanation for this and the lack of screening presents as a significant problem throughout all stages of the criminal justice system (Myers, 2004; Cooper & Allely, 2017). Using the Autism Quotient (AQ-20), Underwood, McCarthy, Chaplin, Forrester, Mills and Murphy (2016) identified high levels of unrecognised ASD traits among a group of male prisoners (N = 240) in an adult male prison in London in the United Kingdom (UK). Of the 186 adult males approached on the prison wings, 10% screened positive and 2% fulfilled the diagnostic criteria for ASD. Many of these identified individuals subsequently received a diagnosis of ASD following further clinical evaluation. Such findings strongly highlight the need for specialist assessment within the criminal justice system for individuals with neurodevelopmental disorders such as ASD. Based on this rate of 2%, the Ministry of Justice (2015) suggests that in prisons in the UK there are approximately 1,600 men and 120 women with ASD (Ministry of Justice, 2015). Importantly, rates of ASD in prison may vary depending on its type (e.g., remanded or sentenced, high-secure, local mainstream prisons, etc.) (Underwood, 2013).

Given that many individuals with ASDs have difficulties in being able to communicate their needs and are at increased risk for experiencing victimisation in the prison, it is crucial that prison staff have at least an adequate understanding of ASD (Jordan, 1999). There has been very little research in this area. In Scotland, Myers (2004) touched on the issue surrounding the knowledge and understanding of ASDs in prison staff. A recent review identified only one study (McAdam, 2009) which explored the knowledge and understanding of the ASD amongst prison staff (Allely, 2015). McAdam identified, within a six-month period, five prisoners with a diagnosis of an ASD (four with a diagnosis of Asperger’s syndrome (AS) and one with autism). Three of the five individuals with ASD appeared to be struggling significantly with the prison environment. Using a survey questionnaire,
McAdam investigated the knowledge and understanding of ASDs in prison staff. The crucial finding of this study was the possibility that individuals with ASDs may not be receiving the care that they need within the prison environment.

Aims of the present review

Another interesting finding based on clinical experience and available evidence is that most individuals with ASD requiring secure care are likely to be on the higher functioning end of the autism spectrum (Barkham, Gunasekaran, & Lovelock, 2013). Murphy and colleagues have emphasised that patients with ASD present with specific assessment, specific difficulties, needs and therapeutic issues and therefore are a challenging group for forensic services (Murphy, 2010; Murphy, Murphy, Mullens, & Mullens, 2017). Lastly, within secure hospital settings, Gunasekaran (2012) argued that there appears to be an increasing number of individuals identified with ASD. Given the challenge that individuals with ASD present to forensic services, the suggested increase in the number of this group within this setting and the relatively little amount of research which suggests they face a number of difficulties within the prison environment, the present review will investigate what studies have been carried out investigating any aspect of ASD in relation to secure hospital settings. For instance, studies investigating the prevalence, experiences, treatment outcomes, etc, in patients with ASD in secure forensic settings.

Method

Seven internet-based bibliographic databases were used for the present review including: Journals@Ovid Full Text May 26, 2017; PsycARTICLES Full Text; AMED (Allied and Complementary Medicine) 1985 to May 2017; HMIC Health Management Information Consortium 1979 to January 2017; PsycEXTRA 1908 to May 15, 2017; PsycINFO 2002 to May Week 4 2017 and Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily, Ovid MEDLINE and Versions(R). No date limitations were placed on the search conducted on these databases above. These seven databases were searched in order to identify studies which investigated ASD within a secure psychiatric hospital/facility. For instance, studies which looked at the cognitive profile of individuals with ASD in secure settings, prevalence of ASD in secure settings, experiences of individuals with ASD in secure settings, views or knowledge of ASD in secure hospital staff, etc. Following a scoping search of the field, there were relatively few studies found across these areas. Given this, it was decided that this review would take a more inclusive approach to the literature. The flowchart below (Figure 1.) describes the process of eliminating non-relevant papers in the present review following PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) guidelines (Liberati, Altman, Tetzlaff, Mulrow, Götzsche, Ioannidis, et al., 2009). The PRISMA guidelines were developed by an international group which consisted of experienced authors and methodologists. The PRISMA Statement contains a 27-item checklist and a four-phase flow diagram. The checklist consists of items which are considered key to ensuring transparent reporting in a systematic review (Moher, Liberati, Tetzlaff, & Altman, 2009; Liberati et al., 2009).
Duplicates were excluded prior to the retrieval of references. Searches on all seven databases were conducted on the 26th May 2017. The following search criteria (using keywords) were entered into the seven databases using no date limits: (neurodevelopmental or ASD or autism or autistic or "autism spectrum*" or "asperger's syndrome" or asperger's or aspergers or "autistic spectrum condition*" or "autism spectrum disorder*").mp. [mp=ti, ab, ct, sh, hw, ot, id, tc, tm, nm, kf, px, rx, an, ui, sy] AND ("high secure psychiatric hospital*" or "high security psychiatric hospital*" or "high security hospital*" or "secure hospital*" or "high secure" or "secure care").mp. [mp=ti, ab, ct, sh, hw, ot, id, tc, tm, nm, kf, px, rx, an, ui, sy].

The search returned 96 articles. There were five duplicates and after these were removed there were 91. Five articles found in the databases search meet the inclusion criteria of this review.

In addition to these database searches, numerous permutations of ASD and other search terms relating to the court process were entered into Google Scholar and thoroughly searched for articles which were not identified through the database searches, for instance, "high secure" AND autism; "high secure" AND Asperger's. The reference section was carefully examined for potential relevant studies in each systematic review, literature review or commentary paper. All references contained in the papers identified as relevant from the database searches were also examined for possible inclusion in this review. Searches on Googlescholar resulted in the identification of seven articles which met the inclusion criteria of this review. Given the relatively little research in this field this review is more inclusion than exclusion.

In total, twelve articles meet the inclusion criteria and were included in this review.

Abstracts for each reference were obtained and screened using the following criteria:

Inclusion criteria:

1. Human study population
2. Papers which investigated autism spectrum disorders within a low, medium or high secure psychiatric hospital (or other terms to describe this such as high secure unit; high secure hospital, secure hospital, secure settings, etc).

Exclusion criteria:

1. Paper not published in English
2. Papers investigated did not focus on autism spectrum disorders but intellectual disabilities or other disorders/conditions such as personality disorders, etc.
3. Papers which report on cases of individuals with both intellectual disabilities and ASD.
4. Papers which are not peer reviewed articles.
5. Studies which do not investigate the cognitive profile of individuals with ASD in secure settings, prevalence of ASD in secure settings, experiences of individuals with ASD in secure settings, views or knowledge of ASD in secure hospital staff, etc.

Results

Twelve studies were identified which looked at some aspect of ASD within secure psychiatric hospitals. These studies were reviewed using the following six categories: prevalence of ASD in secure psychiatric hospitals; evaluating the clinical utility of the AQ screening tool to assess self-reported autistic traits in secure psychiatric settings; characteristics of patients with ASD detained in secure psychiatric hospitals; experiences and quality of life of patients with an ASD detained in secure psychiatric care; awareness and views of ASD held by staff working within a secure psychiatric hospital and interventions/treatment outcomes with patients with ASD in secure psychiatric hospitals. It is interesting that the vast majority of studies identified and included in the review were conducted in the UK.

Prevalence of ASD in secure psychiatric hospitals

Only three peer reviewed articles were identified in the present review which explored the prevalence of ASD within secure environments. First, Scragg and Shah (1994) investigated the hypothesis that Asperger's syndrome (AS) may go unrecognised in forensic settings. In their seminal study, they screened the entire male patient population (n = 392) in Broadmoor Special Hospital by examination of case notes in order to determine the prevalence of AS. Patients identified following the screening process were then observed and interviewed and key staff members also took part in a semi-structured interview. The screening of the 392 patients (stage 1) produced 17 cases for stages 2 and 3 of the study. Six patients refused to meet the investigator. However, through interviews with members of staff and examination of these patients’ medical files, detailed information was obtained on all 17 cases. Using all information collected through examination of case records and staff and patient interviews, a diagnosis was made. Of the 17 cases, six patients were found to fulfil the strict diagnostic criteria for AS (Gillberg & Gillberg, 1989). Three patients were equivocal meaning that they met most but not all of the criteria, partly due to a lack of information. For two of the three equivocal patients, information was lacking on early childhood. The third equivocal patient refused to be interviewed. Characteristic features of ASD was exhibited in all three equivocal cases (Wing, 1991). The remaining eight cases were clearly not AS. The findings of six patients with a diagnosis of AS produces a prevalence rate of 1.5% for this population. Interestingly, only two of these six patients
had previously been diagnosed as having AS which indicate that AS is not always recognised (Scragg & Shah, 1994). The prevalence increases to 2.3% if the three equivocal cases are included which is much greater compared to that found in males in the general population. The most conservative figure for the prevalence of AS in males in the general population was found by Ehlers and Gillberg (1993) to be 0.55%. Given this, compared to the prevalence found in the general population, the prevalence of AS in Broadmoor Hospital is about three times greater. Examining the types of offenses committed by the six men at Broadmoor diagnosed with AS, three had been physically violent, one had committed arson, and two exhibited aggressive behaviour on the wards (e.g., feigning punches and threatening to cause injury to others).

In the second prevalence study, Hare, Gould, Mills & Wing (1999) screened a total of 1305 residents in the three special hospitals in the UK. Hare and colleagues screened 96% of the special hospital population resident in the three hospitals. Using a score of five as the cut-off point for further investigation of a possible ASD resulting in a total of 240 patients across the three special hospitals (twenty-five of the 240 patients could not be followed up in the second stage due to a variety of reasons such as patients being discharged). From the 215 cases of patients who scored over five on the screening questionnaire, 31 definite cases of autistic conditions were identified based on information in their hospital records (there were no significant differences across the three hospitals in the number of definite cases of ASD). Thirty-one cases equates to 2.4% of the population screened. This is consistent with the higher estimate indicated by Scragg and Shah (1994) in the study they carried out in Broadmoor. There were also 31 equivocal cases. This 'uncertain' group comprised of individuals where the diagnostic criteria was only partially met and/or where there was a lack of sufficient information to make a clear diagnosis of ASD. In the general population, the highest estimated rate for ASDs is 0.71% for individuals with I.Q. greater than 70 (Wing, 1996). The lowest prevalence estimate for the Special Hospitals population (2.4%) is more than three times the prevalence found in the general population. For all three groups, mean length of time in hospital were similar and was as much as two to three years longer than the average of 8.5 years reported for patients detained in a Special Hospital (Taylor et al., 1998). Lastly, compared to the other groups, the group diagnosed as having ASDs had significantly more circumscribed interests and repetitive routines. Commonly reported circumscribed interests included violence, weapons and Nazism. The special interests were found in some of the cases to be directly related to the offence committed (Hare, Gould, Mills, & Wing, 1999). Lastly, although this review is excluding studies which look at individuals with an intellectual disability as well as ASD, the following study was still included as it carried out a comparison between patients with intellectual disability with and without ASD. Esan and colleagues (2015) investigated the characteristics and prevalence of those with ASD treated within a 64-bed specialised forensic intellectual disability hospital in England compared to those without ASD. Of the 138 (cohort of patients treated over a six year period), 42 (30%) had an ASD (Esan, Chester, Gunaratna, Hoare, & Alexander, 2015). However, it is important to point out here that a number of studies and papers have highlighted the relatively high rate of intellectual disabilities in both children and adults with ASD in the general population/community samples (e.g., La Malfa, Lassi, Bertelli, Salvini, & Placidi, 2004; Matson & Shoemaker, 2009; Postorino, Fatta, Sanges, Giovagnoli, De Peppo, Vicari, & Mazzone, 2016; Tonnsen, Boan, Bradley, Charles, Cohen, & Carpenter, 2016).
Evaluating the clinical utility of the AQ screening tool to assess self-reported autistic traits in secure psychiatric settings

The autism spectrum quotient (AQ, Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001) is a self-report screening tool used to assess autistic traits. Murphy (2011) carried out a study which is the first examination of the AQ among patients detained in high secure psychiatric care (HSPC). The researchers examined the profiles of 105 male patients detained within HSPC (about 47.7% of the total patient population). The sample of patients comprised of three groups: mentally ill individuals with DSM IV-defined psychotic disorders, such as paranoid schizophrenia, schizoaffective disorder (MI group, n=69), a group with a range of different personality disorders including borderline and anti-social (PD group, n=24) and a group of patients with an ASD (ASD group, n = 12). All patients in the study exhibited a Wechsler Adult Intelligence Scale III (WAIS III, Wechsler, 1997) full scale IQ score above 70. Patients ranged in age from 19 to 66 years. Average age or performance on neuropsychology measures were not significantly different between the diagnostic groups. Findings revealed that the individuals with ASD exhibited a significantly higher total AQ scores compared to those without a diagnosis of ASD. However, the social skill, communication and attention switching subscales of the AQ were found to be what significantly discriminated the patients with ASD from those with MI and PD. Interestingly, Murphy (2011) found that two of the AQ subscales, namely, attention to detail and imagination seemed to have less discriminative validity in this population of patients. Murphy (2011) suggests that a possible explanation for this is that these subscales “reflect common features associated with institutionalised psychiatric patients, such as a need for routine, a sensitivity to change in their immediate environment, as well as perspective taking and empathy difficulties” (Murphy, 2011, pp. 529).

Characteristics of patients with ASD detained in secure psychiatric hospitals

Only three studies were identified which explored any type of characteristics of patients with ASD detained in secure psychiatric hospitals (Murphy, 2003; Haw, Radley, & Cooke, 2013; Murphy, 2014). Noting that there is a dearth of research and understanding of the characteristics of patients with ASD in secure care and how they compare to those from non-ASD populations, Haw, Radley and Cooke (2013), investigated the characteristics of male forensic patients with ASD in low-secure care and compared them to patients without ASD. Specifically, they used two ASD units (one in Northampton and the other in Birmingham) and one non-ASD unit at a tertiary referral centre. During the study period, there were 51 ASD patients admitted to the two ASD units. However, six sets of case notes could not be traced which resulted in a total of 45 ASD patients for inclusion in the study. The control group comprised all available 43 non-ASD low-secure admissions. Haw and colleagues found a number of significant differences between the groups. For instance, those with ASD were younger (median age of ASD patients was 27 years versus 33 years for the controls). They were also younger at their first contact with psychiatric services. Interestingly, most patients with ASD were admitted from other hospitals. However, a substantial minority were admitted from prisons and courts. On the other hand, only two control group patients came from prison and the courts, with most of the other controls coming from other hospitals. Compared to the
control group, a greater proportion of the ASD group were on Part III (forensic) sections of The Mental Health Act 2007 (MHA). In the group of ASD patients, twelve patients (26.7%) only had a diagnosis of ASD and thirty-three patients (73.3%) had psychiatric co-morbidities. Specifically, schizophrenia and related psychotic disorders were the most common psychiatric comorbidities (a small number of patients also had learning disabilities and hyperkinetic disorder). In total, 17 (37.8%) patients with ASD were subject to restriction orders. The ASD group were found to be less likely to have a diagnosis of alcohol or substance misuse or dependence and were also found to be less likely to have a personality disorder. A lifetime history of alcohol misuse was found in 37.8% of patients with ASD and 55.8% of controls (however, this was not found to be statistically significant). A lifetime history of drug misuse was less likely in the ASD group. A lifetime history of physical violence was found in 77.8% of ASD patients but this was significantly lower compared to the control group (93.0%). A lifetime history of self-harm was found in 37.8% of the patients with ASD. This was lower than the control group (55.8%) but not statistically significantly different. A history of repetitive self-injury was found in an additional five (11.1%) patients with ASD. Compared to the controls, a lifetime history of sexually inappropriate behaviour was less common in the ASD group. In the cases involving sexually inappropriate behaviour, it was sometimes of an unusual nature. For instance, in the case involving voyeurism, the patient with ASD had repeatedly entered ladies’ toilets to look into cubicles. Unusual index offences were found in some of the patients with ASD. For instance, stalking (one patient delivered razor blades in the post to an organisation which had not offered him a job), arson of an atypical nature (one patient set fire to a pile of his own clothes after being moved to a residential home he did not want to live in) or bizarre damage to property (one patient poured water into the computers at a job centre). Compared to the controls, in the ASD group drug intoxication at the time of the index offence was less common. Findings revealed grievous bodily harm (GBH) or homicide convictions in 33% of the patients with ASD but only 16% of the controls. Some studies have found that ASD offenders are less violent compared to other mentally disordered offenders. Murphy (2003) examined the violence ratings for offending behaviour of patients in a HSPC and found lower violence ratings for their index offence and offending history in the patients with ASD compared to those patients with mental illness or personality disorders. In Haw and colleagues’ study, there was no significant difference between the controls and the patients with ASD in terms of history of antisocial behaviour before the age of 18 years, age of first conviction and having served a custodial sentence. Patients with ASD did, however, have less prior convictions compared to the controls but this could be because of the age difference between the two groups (Haw et al., 2013).

Based on selected admission and neuropsychological details, Murphy (2003) investigated (using patient case-notes) whether male patients with Asperger’s Syndrome detained in a HSPC could be distinguished from patients with schizophrenia or with a personality disorder. The sample population comprised of 39 male patients detained in Broadmoor High-Security Hospital: 13 patients with either a clear or an equivocal diagnosis of Asperger’s Syndrome (AS), 13 patients with a diagnosis of schizophrenia (MI) and 13 patients with a personality disorder (PD) without any history of a psychotic illness. All MI and PD patients were male and aged between 20 and 40 years old and they were selected at random from the same wards as those patients with AS in order to match the
AS group. At the time of the study, the AS sample comprised of all male patients with a formal ASD diagnosis in the hospital. The greatest range of admission sections (five in total) was found in the MI group. However, in the AS group there were two s.3 (admission for treatment), one s.38 (interim hospital order) and ten s.37/49. In the AS group, the distribution of MHA 1983 classifications included: five with a PD classification and eight with an MI classification. A history of alcohol and illicit substance abuse was found in most patients in the MI and PD groups.

In the AS group, only one patient had a history of illicit substance abuse – in this case the drug was amphetamines. Compared to the PD group and the MI group, the AS group had lower index offence (i.e., the offence which resulted in their admission to the hospital) and ‘total violence ratings’ (i.e., the sum of violence ratings for an individual’s index offence and offending history). Compared to those in the PD and MI groups, the offences committed by individuals in the AS group tended to be less severe (i.e., less likely to involve offences where victims died or where victims’ lives were seriously endangered, or which did not result in serious injury). These findings indicate that there are similarities and differences in specific admission and neuropsychological details between the patient groups. However, the key finding was the variation among individual profiles. Specifically, the patients with AS admitted to HSPC were found to be a complex group who were not able to be reliably distinguished from both the MI and PD patients on the basis of their admission and neuropsychological details investigated in the present study. For instance, the AS and PD groups displayed similar neuropsychological profiles in some areas such as on the WAIS-R sub-test Digit Symbol which examines visual orientation and attention, concentration and visual shifting abilities (Murphy, 2003).

In a more recent study, Murphy (2014) investigated self-reported anger among individuals with an ASD detained in HSPC and whether preoccupations had an influence. The population sample consisted of 20 males with an ASD admitted to HSPC for assessment from January 2002 to December 2011. The Preoccupation (PO) group were individuals with offending (index offending) directly linked to pursuing an intense preoccupation (n=10). The non-preoccupied offending group (NPO) were comprised of individuals whose offending appeared to be unrelated to a preoccupation (n = 10) (Murphy, 2014). Findings revealed no significant differences in basic demographic and cognitive functioning details between the PO and NPO group. Based on the findings from the AQ and the experience and expression of anger based on the State trait expression of anger inventory (STAXI 2, Spielberger, 1999), findings indicated that individuals with ASD whose index offending is associated with their preoccupation may have a particular sensitivity towards attending to details in their immediate environment and may even exhibit more difficulties with expressing anger outwardly. Another interesting finding in this study was that the NPO group appeared to have more complex co-morbid psychiatric presentations (e.g., psychosis or a personality disorder) when compared to those whose offending behaviour was associated with pursuing a preoccupation (80% versus 50%) (Murphy, 2014).

Experiences and quality of life of patients with an ASD detained in secure psychiatric care

In the first study of its kind, Murphy, Murphy, Mullens and Mullens (2017) investigated the experience of individuals with an ASD admitted to a high secure psychiatric care (HSPC) hospital. This is the first study to
investigate the experiences of patients with ASD in HSPC. Murphy and colleagues used both a semi-structured interview and a quality of life self-report measure, the Lancashire Quality of Life Profile (LQOLP, Oliver et al., 1996) in order to examine the experiences and views of seven patients with an ASD detained in one HSPC hospital. The study identified a wide variety of both negative and positive aspects of being detained in HSPC from the patients interviewed. Patients with experience of prison thought HSPC was a less stressful environment with more ‘therapeutic opportunities’. When compared to other detained forensic patient groups, patients with an ASD (as a group) reported a similar or significantly better quality of life in a number of areas (including global, leisure, financial and living situation).

However, there are numerous practical improvements which could be implemented/integrated into secure hospitals in order to try and minimise the stress levels in patients with ASD and hopefully impact positively on therapeutic outcomes (Murphy et al., 2017). For instance, one of the hospital procedures described by some patients as difficult was having a limited time to eat meals. Loss of freedom and restrictions in what they are allowed in terms of personal possessions was reported as being extremely difficult for most patients with ASD admitted to HSPC. Restrictions in what they are allowed will be particularly challenging for patients with ASD whose items that are restricted are part of their specific interests. For instance, one patient in the study was not allowed a pair of binoculars to watch aircraft which was a problem. About half of those interviewed reported significant stress due to the level of noise produced by other patients. Trying to get on with those viewed as being bullies or who had unpredictable mental states linked to their illness were also reported difficulties. Despite the majority of patients having lived on or were currently on wards with between 12 and 20 other patients, all felt isolated and without friends. Some individuals were happy with this isolation while others reported wanting increased contact with others they could relate to. All patients reported wanting greater consistency with timetabled programmes and to avoid having activities cancelled. All patients interviewed reported being satisfied with the medical and psychological help they received in the hospital with the exception of just one patient. Additionally, nearly all those interviewed held the view that none of the staff or professionals they came into contact with before coming to HSPC had developed a good understanding of the personal difficulties that they faced (an experience particularly common in those from mainstream prisons, notably those admitted from a category A prison). The only exception to this view were those patients who had been re-admitted from a specialist medium secure ASD unit. All patients who have previous experience of being in a prison described them as being very noisy environments with little privacy. All individuals with ASD in the sample population reported that they felt unsafe from other prisoners in prisons. Consistent with the findings of a HSPC staff survey (Murphy & McMorrow, 2015, described below) are the comments by all patients regarding the importance of staff awareness of ASD and that it would be useful to have a specialist ASD ward in the hospital (Murphy, Murphy, Mullens, & Mullens, 2017).

Awareness and views of ASD held by staff working within a secure psychiatric hospital

Only two studies were identified which investigated awareness, knowledge and/or views regarding patients with ASD held by staff working within secure psychiatric hospitals (Misra et al., 2013; Murphy & McMorrow, 2015).
In the first study, Murphy and McMorrow (2015) carried out a study to explore the views of ASD held by staff working within a HSPC hospital. The authors devised a 15-item questionnaire to explore views (on vulnerability, benefits from therapy and any adjustments they made to their practise), knowledge and training needs of staff in relation to ASD. A total of 206 questionnaires were returned (approximately 60 per cent of those distributed). Findings indicated that the majority of staff reported making adjustments in their practice and held the view that patients with ASD were more vulnerable compared to other patient groups. An important finding was that half of staff reported the view that even though patients with ASD received some degree of benefit from the therapies they engaged in, the staff felt that they were not aware if an individual’s personal difficulties were taken into consideration in their care. Half of staff reported that patients with ASD should be managed differently. The majority of staff reported not having the necessary skills to work with ASD, expressed the wish for more training and argue that such training should be mandatory. With the exception of psychiatrists, the majority of the staff were not aware of the Autism Act (2009). Several staff reported the need for a specialist ASD ward within HSPC (Murphy & McMorrow, 2015). In the second study, Misra, Patel and Edwards (2013) carried out an audit in order to evaluate the need for specialist service for individuals with ASD within HSPC. The authors developed a questionnaire to investigate the clinical practice, willingness and knowledge of the Gold standards of care. The questionnaire was administered on nine wards to the staff on three different shifts. Based on the 100 completed forms returned, findings indicated that the majority of the staff were aware of ASD. However, most of the staff had not heard about ‘standard approach of care’. The study also found that most staff were willing to train and work within a specialist ASD team (Misra, Patel, & Edwards, 2013). It must be pointed out here that there was only an abstract available for this study.

**Interventions/Treatment Outcomes with patients with ASD in secure psychiatric hospitals**

Only three studies were identified which investigated the effectiveness of interventions or treatment of patients with ASD in secure psychiatric hospitals (Murphy, 2010; Esan et al., 2015; MacDonald, MacDonald, Clarbour et al., 2017). One of these studies (Esan et al., 2015) was included in the section above on prevalence of ASD in secure hospital settings. In the first study, Murphy (2010) described the case study of a young man (AB) diagnosed with ASD who was convicted of manslaughter and admitted to HSPC. Several issues identified in the offence formulation were targeted through individual work with AB. The individual work with AB involved education about ASD, the use of an adapted cognitive behaviour therapy (CBT) and skills development in areas such as emotion recognition and general problem solving. Individual work with AB also focused on attempting to improve his difficulties with recognising and appreciating the consequences of his actions on others, victim empathy, dealing appropriately with interpersonal conflict and anger expression. This individual work was informed by evidence of best practise (e.g., Attwood, 2006; Gaus, 2007; Hare & Paine, 1997). AB was offered group work due to his marked impaired perspective-taking abilities and interpersonal anxieties. AB received over 70 hours of individual contact. However, the authors point out that the outcome of this individual work was ‘difficult to quantify’. AB continued to hold an egocentric perspective. Specifically, he exhibited no victim empathy and maintained the view that his actions were justified. AB holds the view that there is a low chance of him re-
offending. Despite this, AB was found to have “significant difficulty with being able to generalise risks to other situations, recognise the association with violence and feeling stressed, as well as the importance of dealing with interpersonal conflict in an appropriate way” (pp. 472). The case of AB (although significantly idiosyncratic), highlights just some of the issues surrounding clinical and risk management which are relevant to many individuals with ASD in forensic services (Murphy, 2010). In their study, MacDonald and colleagues (2017) investigated the challenges and positive experiences of staff members working with sexual offenders who have a diagnosis of ASD.

In order to do this, they utilised a semi-structured interview to investigate the challenges and benefits of working with this particular group. MacDonald and colleagues (2017) interviewed a total of eight participants who worked on the autism specialist ward at a forensic secure hospital in the UK. One of the key findings from the study was the number of challenges that the staff group face and the majority of the staff stated that they would benefit from in-depth training in ASD. The study indicated that further training, more support and “higher levels of staffing may be indicators of organisational intervention points” (pp. 49). Additionally, staff members would benefit from training on the difficulties in successfully treating sex offenders who have ASD. Such training would help staff to manage their expectations in the level of impact and change that they can expect to see as a result of offence focused treatment (MacDonald, MacDonald, Clarbour et al., 2017).

Lastly, in the study by Esan and colleagues (2015) reported earlier in the section on prevalence, they investigated the characteristics of those with ASD treated within a 64-bed specialised forensic intellectual disability hospital in England compared to those without ASD. Of the 138 (cohort of patients treated over a 6-year period), 42 (30%) had an ASD. Compared to a group of patients without a diagnosis of ASD, they found that in the ASD group there were significantly lower rates of personality disorders and harmful use or dependence on drugs. However, in the ASD group, the rate of self-harm was significantly higher. Regarding length of stay and direction of care pathway, there were no significant differences between the two groups. The ASD group was found less likely to be subject to criminal sections or restriction orders compared to the group without ASD. Despite some of the differences found between the two groups, their treatment outcomes appear to be similar. Esan and colleagues argue that these findings indicate that “the diagnostic category of ASD alone may be inadequate in predicting the treatment outcome” (Esan et al., 2015, pp. 193). Esan and colleagues argue that their findings indicate that there is a need to identify ‘distinct typologies’ within patients with ASD (Esan et al., 2015).

Discussion

In total, 12 studies were included in this review. Only three studies looked at the prevalence of ASD in secure psychiatric hospitals (Scragg & Shah, 1994; Hare et al., 1999; Esan et al., 2015). All three studies indicated a prevalence of ASD within the secure forensic settings which was higher than that found in the general population. Only one study evaluated the clinical utility of the AQ screening tool to assess self-reported autistic traits in secure psychiatric settings (Murphy, 2011). Only three studies explored any type of characteristics of patients with ASD detained in secure psychiatric hospitals (Murphy, 2003; Haw, Radley, & Cooke, 2013; Murphy, 2014).
Interestingly there was only one study identified which investigated the experiences or quality of life of patients with an ASD detained in secure psychiatric care (Murphy et al., 2017). Only two studies were identified which investigated awareness, knowledge and/or views regarding patients with ASD held by staff working within secure psychiatric hospitals (Misra et al., 2013; Murphy & McMorrow, 2015). Only three studies were identified which investigated the effectiveness of interventions or treatment of patients with ASD in secure psychiatric hospitals (Murphy, 2010; Esan et al., 2015; MacDonald et al., 2017). The study by Esan and colleagues (2015) was also included in the section on prevalence.

Screening for ASD: The clinical utility of the AQ with forensic psychiatric patients

Using the autism-spectrum quotient (AQ) with forensic psychiatric patients

The autism-spectrum quotient (AQ, Woodbury-Smith, Robinson, Wheelwright, & Baron-Cohen, 2005) appears to be clinically useful in assessing the presence of ASD among patients admitted to HSPC. A recent study identified and described a number of screening tools for ASD that can support clinicians or researchers in trying to determine whether a more comprehensive ASD assessment is warranted (Sappok, Heinrich, & Underwood, 2015). Interestingly, only one study was identified in the present review which investigated the clinical utility of an ASD screening tool in forensic psychiatric patients with ASD (Murphy, 2011). In his paper, Murphy (2011) highlighted the urgent need for a forensic version of the AQ. Despite the clinical utility of the AQ in assessing the presence of ASD among patients admitted to high security psychiatric care, there are significant issues related with symptom validity (which are common to all self-report instruments). Importantly, the use of the AQ may be limited only to those individuals with sufficient literacy skills. There have been a number of studies which have found ‘extremely poor literacy skills’ in prisoners, for instance (e.g., Creese, 2016). Given the well-established high rate of patients and prisoners with poor literacy skills, Murphy (2011) recommends the need for an adapted version of the AQ which could be conducted using a semi-structured interview approach.

McCarthy and colleagues (2015) have also highlighted a number of studies which reported limitations on using the AQ as a diagnostic screen rather than as a tool to identify specific traits of autism (e.g., Hoekstra, Bartels, Cath, & Boomsma, 2008, Sizoo, van den Brink, Gorissen-van Eenige, Koeter, van Wijngaarden-Cremers, & van der Gaag, 2009). Another important issue with the currently employed screening tools are their cultural sensitivity, particularly within a forensic setting such as a prison. In a study carried out by McCarthy and colleagues (2015), their findings indicated that prisoners from black or minority ethnicity (BME) backgrounds were at increased risk of their neurodevelopmental disorders and difficulties (NDD) symptoms going unrecognised by the current screening instruments. McCarthy and colleagues found that screening methods in their study identified “more white prisoners with NDD than was representative of the broader prison population, despite a lack of sampling or referral bias” (McCarthy et al., 2015). This is consistent with the findings from other studies (e.g., Fazio et al., 2012).

However, poor literacy skills are common in many prisoners and patients which necessitates the need to adapt the currently used AQ, perhaps enabling the tool to be delivered in a semi-structured interview. One common issue
which arose during the use of the AQ with the patients with ASD was the difficulty that many had in deciding on one answer. Moreover, some items in the AQ are difficult for many individuals to directly relate to (Murphy, 2011). There is also a growing concern over the clinical utility of the AQ and not just in forensic settings (e.g., Ashwood et al., 2016). This suggests the need for the development of an ASD screening tool for use in forensic settings and one for use in community settings.

The need to adapt risk assessment tools for offenders with ASD

Numerous clinicians and researchers have highlighted the urgent need for good practice guidelines in order to assess risk in individuals with a diagnosis of ASD (Murphy, 2013). Such an ‘ASD sensitive risk assessment guide’ would comprise of both the factors which may increase the vulnerability of individuals with ASD to engage in offending behaviour (e.g., communication; cognitive and sensory impairments; social awareness, vulnerability, sensitivities, preoccupations, unusual interests, anxiety provoking situations and obsessions or compulsions) and the factors that may be protective (e.g., an immediate environment which is well-structured and unambiguous). (Murphy, 2010; Gunasekaran, 2012). The majority of risk assessments explore a number of factors which are not relevant for offenders with ASD (e.g., presence of delusions, hallucinations, compliance with medication, use of illicit drugs and exacerbating psychotic symptoms) (Gunasekaran, 2012). In one of the papers identified in this review, Murphy (2010) described the case of AB. This case draws attention to some important issues regarding risk management for individuals with ASD who are detained in HSPC. Numerous factors which are relevant for individuals with ASD who offend are not captured by conventional formal risk assessment guides such as The Historical Clinical Risk Management-20, Version 3 (HCR 20, Douglas, Hart, Webster, & Belfrage, 2013) (Webster et al., 1997). Similar to many individuals with ASD, for AB key risk factors for offending are associated with his communication, cognitive and sensory hypersensitivity impairments (Murphy, 2010). Lastly, there is a need for more research to explore whether it is more appropriate to try and integrate ASD patients with other patients or whether a specialist ASD service within the hospital would be more useful (Murphy, 2010).

Length of acute care for patients with ASD

The Autism Act which was passed in 2009 introduced the Adult Autism Strategy, which sets out how local services should be improved in order to address the needs of adults with ASD. In low and medium secure forensic settings there are specialist services available to care for offenders with ASD. However, there is relatively little dedicated support in high secure settings (Misra, Patel, & Edwards, 2013). There are three High Secure Psychiatric Hospitals in the UK. In secure care in the UK, individuals with ASD typically have longer durations of acute care (Hare et al., 1999; Haw, Radley, & Cooke, 2013; Bathgate, 2017). There have been a number of suggestions put forward to try and explain this. One suggestion that has been posited for this is the lack of specialist knowledge regarding their specific rehabilitation needs (Hare et al., 1999; Haw, Radley, & Cooke, 2013). Another suggestion posited (Bathgate, 2017) is the lack of low secure services in the UK where the patient may progress through meeting rehabilitation goals. Regarding the overrepresentation of those with ASD in high secure forensic units
(Scragg & Shah, 1994; Hare et al., 1999; Esan et al., 2015), the limited number of low-secure or community based services may be one possible explanation for this (Bathgate, 2017).

**Limitations**

It is possible that the search terms utilised in the search for the present review did not capture all of the relevant research in the area of secure psychiatric hospitals and ASD. This was the justification for conducting the additional searches on “Google scholar” using specific search criteria as outlined in the methods section in order to try and minimise this potential limitation as much as possible.

**Clinical implications**

Need for the development of an ASD screening tool which is not male-biased

Supporting the findings of Gillberg (1992), clinical impressions indicate that ASDs are exhibited in subtle ways in women. A meta-analysis found that compared to males with ASD, on average, females with ASD display less restricted, repetitive behaviours, and interests (RRBI) (e.g., on the Autism Diagnostic Interview–Revised [ADI-R] and/or the Autism Diagnostic Observation Schedule [ADOS]) (Van Wijngaarden-Cremers, van Eeten, Groen, Van Deurzen, Oosterling, & Van der Gaag, 2014). Many females with ASD may go unidentified if RRBIs continue to be regarded as key diagnostic criteria (Rynkiewicz et al., 2016). In order to address this issue there is a need to collect a broad range of behaviours which go beyond those contained in the male-biased autism screening tools and diagnostic assessments currently used (Lai, Lombardo, Auyeung, Chakrabarti, & Baron-Cohen, 2015; Lai, Baron-Cohen, & Buxbaum, 2015; Allely, Wood, & Gillberg, under review). The need for greater awareness and recognition of how autism symptomology can present in females with ASD and a tool to assist in the identification of possible ASD in females is clearly of great importance. Given the above, it would be important to carry out an empirical study of the women residents in the special hospitals. The majority of the samples included in the studies identified in the present review included adult males.

Need for more staff training on ASD

A number of the studies identified in this review highlighted the need for more staff training on ASD (Misra et al., 2013; Murphy & McMorrow, 2015). Both these studies clearly highlight that in HSPC, despite some advancement with implementing the government’s Autism Strategy (2010), there is a need for more awareness training in promoting staff confidence to work with this particular patient population (Misra et al., 2013; Murphy & McMorrow, 2015). The study by Misra and colleagues (2013) indicated that most staff were willing to train and work within a specialist ASD team.

**Future research directions**

Regarding therapy, Kelbrick and Radley (2013) have adopted cognitive analytic therapy (CAT) as their main therapeutic approach in their unit because of its focus on reciprocal roles and relationships. They have found this therapy to have a positive impact on their patients anecdotally and highlight the need for research to empirically
investigate psychotherapeutic approaches in adults with ASD. Additionally, more research is required looking at patients with ASD in secure forensic settings to determine which approaches and types of interventions are most effective in improving outcomes and the patient factors which are linked to good prognosis (Haw, Radley, & Cooke, 2013; Murphy, 2010). A systematic review of the literature conducted by Melvin, Langdon and Murphy (2017) revealed significant variability in the effectiveness of treatment programmes for offenders with ASDs and the impact of ASD symptoms on treatment outcomes. This review emphasised the need for more controlled research into these issues (Melvin, Langdon, & Murphy, 2017). Treatment outcomes would include: improvements in clinical symptoms and behaviour; quality of life (QoL); patient experience of care (e.g., satisfaction); length of hospital stay; the use of ‘reactive’ or ‘restrictive’ interventions (for instance, the use of physical interventions and seclusion, pro re nata (PRN) medication or a change in observation levels) and re-offending and risk (these are some of the treatment outcomes that have been used in a number of studies, e.g., Morrissey et al., 2017).

More research is also needed to examine both the individual and environmental factors which may increase the vulnerability in some individuals with ASD towards developing and acting on problematic preoccupations. In the study by Murphy (2014) identified in the present review it was found that, compared to those patients with ASD whose offending was linked to pursuing a preoccupation, individuals with offending which was not linked to pursuing a preoccupation appear to have more complex co-morbid psychiatric presentations (e.g., psychosis or a personality disorder) (Murphy, 2014). Further research is also needed to explore alcohol and illicit substances use in patients in secure psychiatric hospitals (Murphy, 2003).

Despite the growing body of research investigating the association between ASD and offending (e.g., Mawson, Grounds, & Tantam, 1985; Baron-Cohen, 1988; Murrie, Warren, Kristiansson, & Dietz, 2002; Schwartz-Watts, 2005; Woodbury-Smith, Clare, Holland, Watson, Bambrick, Kearns, & Staufenberg, 2010; Radley & Shaherbano, 2011; Søndenaa, Helverschou, Steindal, Rasmussen, Nilson, & Nøttestad, 2014), there is currently no tool to aid practitioners when assessing individuals with ASD who have offended. In their paper, Shine, Shine, Cooper-Evans and Cooper-Evans (2016) outline the initial development of a framework which would aid clinicians in their case formulation for individuals with ASD who have been convicted. Information is collated on the presence of ASD features from an individual’s developmental history, index offence and offence paralleling behaviours would be obtained by the clinician in the proposed framework outlined in the paper. As a result, an informed assessment of the possible contribution of ASD to offending could be made (Shine, Shine, Cooper-Evans, & Cooper-Evans, 2016).

**Conclusion**

There are a number of challenges to treatment in individuals with ASD due to the idiosyncratic and heterogeneous nature of the condition. Given the lack of a well-established evidence base, “individual case formulation informed by multidisciplinary assessments is essential to their rehabilitation” (Barkham, Gunasekaran, & Lovelock, 2013, pp. 14). As emphasised by Murphy (2010a), for patients with ASDs, forensic services struggle to manage and provide adequate placements. Staff awareness of ASD is crucial to the effective management of patients with ASD.
and it has been strongly advocated that this training is mandatory (Murphy & McMorrow, 2015; Murphy, Murphy, Mullens, & Mullens, 2017). As highlighted by Murphy (2011), poor literacy skills are common in many prisoners and patients which necessitates the need to adapt the currently used AQ, perhaps enabling the tool to be delivered in a semi-structured interview. One common issue which arose during the use of the AQ with the patients with ASD was the difficulty that many had in deciding on one answer. Moreover, some items in the AQ are difficult for many individuals to directly relate to (Murphy, 2011). There is also a growing concern over the clinical utility of the AQ and not just in forensic settings (e.g., Ashwood et al., 2016). This suggests the need for the development of an ASD screening tool for use in forensic settings and one for use in community settings.

Compliance with Ethical Standards

Conflict of Interest

xxxx has no conflicts of interest to declare.

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Bonora, E., Graziano, C., Minopoli, F., Bacchelli, E., Magini, P., Diugiovanni, C., ... & Marasco, E. (2014). Maternally inherited genetic variants of CADPS2 are present in Autism Spectrum Disorders and Intellectual Disability patients. *EMBO Molecular Medicine, 6*(6), 795-809.


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Millon Multiaxial Personality Inventory – MCMI III (Millon, 1997, 2006).


**Figure 1.** Flow of Information through Systematic Review.

- **Identification**
  - Number of references identified through database search – 96
  - Number of additional references identified as relevant through other sources such as Google scholar searches – 7
  (Additionally, all references contained in every relevant paper - even review papers - identified in database search were examined for any relevant papers that meet the review inclusion criteria - not included in figure here).

- **Screening**
  - Number of abstracts screened – 26
  - Number of duplicates removed through reading titles of abstracts – 5
  - Number of abstracts screened – 26
  - Number of references excluded – 8

- **Eligibility**
  - Number of full text articles assessed for eligibility - 18
  - Number of full text articles excluded – 6

- **Included**
  - Number of papers eligible – 12
  - Number of papers unobtainable – 0
  - Number of studies included in the synthesis – 12

**Legend:**
- **Identification**: Number of references identified through database search
- **Screening**: Number of duplicates removed through reading titles of abstracts
- **Eligibility**: Number of full text articles assessed for eligibility
- **Included**: Number of studies included in the synthesis