

Self-harm and Mental Health Characteristics of Prisoners with Elevated Rates of Autistic Traits

Self-harm and Mental Health Characteristics of Prisoners with
elevated rates of autistic traits

Eddie Chaplin ¹

Jane McCarthy ²

Clare S Allely ³

Andrew Forrester ⁴

Lisa Underwood ²

Hannah Hayward ⁵

Jess Sabet ⁵

Susan Young ⁶

Richard Mills ⁷

Philip Asherson ⁵

Declan Murphy ⁵

¹ London South Bank University Institute of Health and Social Care, United Kingdom of Great Britain and Northern Ireland

² Faculty of Medical and Health Sciences, University of Auckland, Auckland, New Zealand.

³ University of Salford in Manchester, , United Kingdom of Great Britain and Northern Ireland

⁴ Cardiff University, , United Kingdom of Great Britain and Northern Ireland

⁵ King's College London, United Kingdom of Great Britain and Northern Ireland

⁶ Psychology Services Limited

⁷ ATAutism

Highlights

- Prisoners with elevated autistic traits were significantly more likely to report having thought about self-harm or suicide than neurotypical prisoners
- Prisoners with elevated levels of autistic traits were also more likely to report having attempted suicide during their lifetime compared to neurotypical prisoners
- Prisoners with elevated levels of autistic traits were more likely to have comorbid depressive and generalised anxiety disorders compared to neurotypical prisoners.
- More research is required to inform the development of effective support and protective systems for autistic prisoners or those with elevated levels of autistic traits

Abstract

Background: Prevalence studies among prisoners have found rates of 1 to 4% for autism spectrum disorder (ASD) or autistic traits. However, little is known about those prisoners with high levels of autistic traits.

Aim: This aim of this study was to compare the mental health characteristics of prisoners with autistic traits with neurotypical prisoners not screening positive for neurodevelopmental disorders.

Method: The study recruited 240 male prisoners from a London prison and screened for autism spectrum disorder using the Autism Quotient (AQ) 20 and 10, and Autism Diagnostic

Observation Schedule (ADOS). The Mini International Neuropsychiatric Interview was used to assess for depression, anxiety, self-harm behavior and suicide.

Results: Screening using the AQ identified 46 prisoners with significant autistic traits, with 12 meeting the diagnostic threshold for ASD using the ADOS. Those screening positive with autistic traits were significantly more likely to have thought about self-harm and suicide in the past month than neurotypical prisoners and have a comorbid mental disorder. They were also significantly more likely to report having attempted suicide during their lifetime compared to neurotypical peers at a rate of 64.9% compared to 11.6% for the neurotypical prisoners

Conclusion: Prisoners with elevated levels of autistic traits were more likely to report self-harm, suicidal thoughts and were more vulnerable to a range of mental disorders than neurotypical prisoners. There is a need for more evidence on the experience of autistic prisoners to inform how pathways should work to improve health outcomes through increased awareness and access to screening and subsequent diagnosis which currently prisons are currently not set up for.

Keywords: autistic spectrum disorder, autistic traits, mental illness, prisoners, screening, self-harm and suicidality,

What this paper adds?

The elevated presence of autistic traits and neurodevelopmental impairments are not often considered when screening and assessing prisoners as part of the routine health screening. The presence of elevated levels of autistic traits has been put forward as a risk factor for psychiatric disorder. This paper increases our knowledge of prisoners with elevated autistic traits who reported higher levels of mental illness and thoughts of self-harm and suicidal ideation compared to neurotypical prisoners. This study has shown there is a need to consider this group given the

elevated clinical need, relating to mental health and risk to self, by improving identification and awareness within custodial settings

Self-harm and Mental Health Characteristics of Prisoners with elevated rates of autistic traits

1. Introduction

Autism spectrum disorder (ASD) is an early onset, pervasive and lifelong neurodevelopmental disorder. It is characterized by impairments in social communication and repetitive, restricted behaviour patterns and atypical response to sensory stimuli (American Psychiatric Association, 2013). There is significant variation in the course and presentation of ASD depending on multiple factors for example severity of core and secondary symptoms, the level of intellectual ability and adaptive functioning possessed by the (Ronald & Hoekstra, 2011). ASD is viewed as being a spectrum disorder, with significant phenotypic and genotypic heterogeneity (Abrahams & Geschwind, 2008). It may be part of a Broader Autism Phenotype (BAP) (Sucksmith, 2012), or explained by a sub threshold autism spectrum model which encompasses those on the spectrum with a diagnosis and those who are sub threshold acknowledging the different severity of presentation (Dell'Osso et al., 2016). It is hypothesised that individuals with autistic traits have a higher vulnerability towards psychopathology and risk of comorbid mental health problems (Dell'Osso et al., 2019; Dell'Osso, Lorenzi, & Carpita, 2019). Recognition of ASD is key to successful clinical intervention and service provision (National Audit Office, 2009). It is still common for individuals with elevated levels of autistic traits to remain unrecognised in adulthood. Therefore, the assessment of ASD in high-risk adult populations, e.g. in the criminal justice and mental health services requires the further development of screening and diagnostic assessments within these services (Underwood et al., 2016).

The exact prevalence of ASD within prisons is currently unknown (Robinson et al., 2012). As previously highlighted by (Chaplin & McCarthy, 2014) in the United Kingdom, screening for ASD is not part of the usual prison process. This lack of screening for ASD presents a significant problem across the whole of the criminal justice system (Cooper & Allely, 2017; Myers, 2004). There were 77,738 prisoners in the United Kingdom in April 2021 (Justice & Service, 2021). Estimates of autistic prisoners range from 1 to 4.4% (Fazel & Seewald, 2012; Robinson et al., 2012). It is important to consider that the rates of ASD in prison may vary depending on the type of prisoners (remand or sentenced) or by level of risk (Underwood, Forrester, Chaplin, & McCarthy, 2013). Although research into prisoners with autism has grown, there is little specific to those with elevated levels of autistic traits. Often this group will present with high level of need, but not be eligible for current services and support. Many will only be recognised initially when they come to the attention of services due to psychiatric conditions or at risk of suicide and self-harm (Dell'Osso et al., 2019). Where often crisis may be avoided with appropriate support.

2. Present Study

Currently there is a lack of agreement as to suitable screening and assessment tools in prisons to identify individuals with autistic traits for a number of reasons (Robinson et al., 2012). These include time constraints and validity of measures in offender populations. Diagnosis of ASD in prison can be difficult as it relies on corroborating evidence which is often not available, as many will have little or no contact with families (Underwood et al., 2016). By introducing screening and diagnostic assessment in a prison setting as part of the present study, several potential

benefits were noted. Screening could assist in making reasonable adjustments, so autistic prisoners who have had previous difficulty can engage in offender treatment programs. This is important as being able to engage can influence decisions on parole or release. Adults with ASD are well recognised to be more vulnerable to mental disorders, with rates of between 16-35% being reported (Royal College of Psychiatrists, 2014, 2020) Studies have found a history of mental health comorbidities to be common in individuals with ASD who have engaged in offending behaviour (Allen et al., 2008; Im, 2016a, 2016b; Newman & Ghaziuddin, 2008; Sabet, Underwood, Chaplin, Hayward, & McCarthy, 2015) including schizophrenia and neurodevelopmental disorders such as attention-deficit/hyperactivity disorder (ADHD). This paper therefore focuses on the issue of these vulnerabilities for autistic prisoners by describing our approach to screening in a prison setting and so allowing a comparison of the mental health, substance and alcohol misuse, self-harm and suicide behaviours and offending characteristics of three groups of prisoners in a local London prison, i.e.:

1. prisoners who have screened positive on the AQ-20/AQ-10 with elevated autistic traits
2. prisoners meeting the diagnostic threshold for the ADOS
3. neurotypical prisoners who have not screened positive for intellectual disability (ID) or attention-deficit/hyperactivity disorder (ADHD) ¹

3. Method

3.1. Participants

The study took place in a male London prison (category C). The official capacity of the prison was 798. The study used a purposive sampling strategy and was able to approach 378

¹ Those screening positive for ID and ADHD were excluded due to high rates of comorbidity

prisoners over the four wings and new prisoners arriving in past 4 weeks. Of these 378 prisoners, 240 consented to screening and subsequent diagnostic assessment. There were complete datasets for suicide and self-harm, mental disorder and substance use for 37 prisoners, of the 46 screened with elevated levels of autistic traits. A control group of 69 neurotypical prisoners with a complete mental health dataset were used for comparison.

Prisoners were only excluded from the study if they lacked capacity to consent or could not understand or express themselves in English. Participants included new arrivals to the prison and referrals by prison healthcare staff, education staff or self-referral.

3.2. Measures

The study collected self-reported data on a range of demographic data as well as rates of previous offending from the prison case note records and used the following measures to define the groups of interest, using recommended predetermined cut off scores and guidance. The 20-item Autism Quotient was used (Brugha et al., 2011; Brugha et al., 2009). A score greater than or equal to 10 was used to indicate the presence of clinically significant autistic traits (Wilson et al., 2014), with 39 prisoners screening positive with significant autistic traits according to the AQ-20 (total score ≥ 10). Of these 32 underwent further assessment. Seven participants were lost to follow-up and 21 did not meet the diagnostic threshold.

The AQ-10 was used on the remaining prisoners to be screened following its inclusion and recommendation from the NICE guidelines which were introduced during the time of the study (Wilson et al., 2014). The change was also made as part of the project's commitment to

sustainability of future screening reflecting best practice following the end of the study. A score greater than or equal to 6 was used to indicate the presence of clinically significant autistic traits. A further seven screened positive, before the end of the study. Diagnostic assessment for ASD was carried out using the Autism Diagnostic Observation Schedule (ADOS) (Lord et al., 1989) and the Autism Diagnostic Interview (ADI-R) (Lord, Rutter, & Le Couteur, 1994). However only two informants were available to complete the ADI-R so limiting the use of this data but illustrated the challenge of identifying informants who can provide a developmental history for those in prison. The standardised ADOS assessment was adapted to meet prison security requirements (Underwood et al., 2016). Evidence from case notes of any previous or current clinical interview was also sought to see if there was an existing ASD diagnosis or evidence to support a positive ADOS and ADI-R assessment.

There is little information of reliability and validity in prison populations of the autism related measures used. In general populations the AQ-10 has reported rates of sensitivity and specificity were reported at 0.88 and 0.91 respectively (Allison, Auyeung, & Baron-Cohen, 2012). Although more recent research has questioned its internal reliability (Bertrams, 2021). Both the ADI-R and ADOS had similar correct classification scores for autism of 0.85 and 0.80, with the ADOS score also dependent on module and algorithm used (Falkmer, Anderson, Falkmer, & Horlin, 2013)

The AQ-20, AQ-10 and MINI were completed by a trained researcher interviewing the prisoner. The ADOS and ADI-R were administered by researchers and mental health professionals trained in their use. Researchers were blinded to previous assessment scores.

Participants from both groups were assessed for suicidality, self-harm, mental disorder, alcohol misuse/dependency and substance misuse/dependency using the Mini International Neuropsychiatric Interview (MINI) (Sheehan et al., 1998) to generate ICD-10 (10th revision of the International Statistical Classification of Diseases and Related Health Problems) diagnoses (World Health Organization, 1992).

ADHD was screened for using the Adult ADHD Self-Report Scale (ASRS-v1.1) (Adler et al., 2006) and the presence of ID using the Learning Disability Screening Questionnaire (LDSQ) (McKenzie, Michie, Murray, & Hales, 2012). Given the transient nature of the prison population, data was not available for all prisoners for suicidality, self-harm, mental health problems and alcohol and substance misuse/dependency. The numbers screened for each of these are listed in the results and tables and represent those with complete data sets in the areas listed. The comparison groups represent neurotypical prisoners, that is all prisoners who did not screen with elevated traits and positive for a neurodevelopmental conditions.

3.3. Analysis

Chi-square likelihood ratios were used to analyse categorical and continuous data, respectively, using SPSS v 22. This method is recommended for small samples and where any of the cell counts may be under five (Özdemir & Eyduran, 2005). The prisoners with elevated autistic traits as measured using the AQ were compared with those prisoners who did not meet the threshold on screening for a neurodevelopmental disorder. We also included those meeting the diagnostic threshold using the ADOS as a separate group in the analysis with the aim to

explore if their risks for comorbid mental disorder and self-harm behaviour differed or not to those with elevated autistic traits using the AQ.

4. Results

In total, of the 240 prisoners, 46 participants screened positive for autistic traits . Of these 12 had a positive ADOS score. Of the 12 only two were known to the prison as having ASD, meaning that 83.3% cases meeting the diagnostic threshold were not identified.

4.1. Demographic

In terms of age distribution, there is little difference between prisoners in the three groups. In terms of ethnicity, white prisoners were significantly more likely to screen positive for autistic traits and made up 91.7% of the ADOS +ve group.. see Table 1

Table 1

Age and Ethnicity between prisoners with no Neurodevelopmental difficulties (ND) traits and those with autistic traits

		No ND n= (153)	+ve autistic traits n= (46)	X2 Sig * P<.05 Sig ** P<.00	ADOS +ve n= (12)	X2 Sig * P<.05 Sig ** P<.00
Age in 10yr intervals	20-29	60, 39.2%	22, 47.8%	$\chi^2 = (n=199) 5.53,$ $P = .137$	5, 41.7%	$\chi^2 = (n=165) 1.06,$ $p = .787$
	30-39	41, 26.8%	10, 21.7%		2, 16.7%	
	40-49	35, 22.9%	13, 28.3%		4, 33.3%	
	50+	17, 11.1%	1, 2.2%		1, 8.3%	
		No ND n= (151)	+ve autistic traits n= (46)	ADOS +ve n= (12)		
Ethnicity N=204	White	65, 43%	37, 80.4%	$\chi^2 = (n=197) 16.48,$ $P < .001^{**}$	11, 91.7%	$\chi^2 = (N=163) 14.73,$ $p < .001^{**}$
	Black	65, 43%	7, 15.2%		0, 0%	
	Asian	21, 13.9%	2, 4.3%		1, 8.3%	

4.2. Risk for self-harm and/or suicide behaviours

Prisoners screening positive with autistic traits were significantly more likely than neurotypical prisoners to report having thought about self-harm or suicide in the month prior to the research assessment. They were also significantly more likely to report having attempted suicide during their lifetime compared to neurotypical peers at a rate of 64.9% compared to 11.6% for the neurotypical prisoners and 45.5% in ADOS +ve prisoners (see Table 2).

Table 2

Current suicide related behaviours and other self-harm between prisoners with no ND traits and those with autistic traits

Suicide related behaviours & self-harm	No ND (n=69)	+ve autistic traits n=(n=36,) #n=37)	X2 Sig * P<.05 Sig ** P<.00	ADOS +ve n = (11)	X2 Sig * P<.05 Sig ** P<.00
Thoughts about self-harm	3, 21.4%	11, 30.6%	$X^2=(n=105) 13.46, P <.001^{**}$	3, 27.3%	$X^2=(n=80) 2.30, P =.129$
Actual self-harm#	1, 12.5%	7, 18.9%	$X^2=(n=106) 10.38, P <.001^{**}$	2, 18.2%	$X^2=(n=80) 3.42, P =.084$
Thoughts about suicide	3, 4.3%	11, 30.6%	$X^2=(n=105) 13.46, P <.001^{**}$	3, 27.3%	$X^2=(n=80) 2.69, P =.101$
Attempted suicide	0, 0%	1, 2.8%	$X^2=(n=105) 2.16, P =.142^{**}$	0,0%	$X^2=(n=80) 10.63, P =.428$
Suicide attempts #(Lifetime)	8, 11.6%	24, 64.9%	$X^2=(n=106) 32.36, P <.001^{**}$	5, 45.5%	$X^2=(n=80) 2.96, P =.086$

4.3. Mental illness and personality disorder comorbidities

Table 3 shows that prisoners screening positive with autistic traits were more likely to have comorbid major depressive episode, generalised anxiety disorder, social phobia and anti-social personality disorder. They also had higher rates of all other comorbid mental disorders such as psychosis but the numbers were too small to show any significant difference. The neurotypical prisoners and those with elevated levels of autistic traits had much higher rates of antisocial personality disorder compared to the ADOS +ve prisoners. The ADOS +ve group significantly

more likely to be diagnosed with anxiety related disorders namely social phobia and obsessive-compulsive disorder.

Table 3

Current mental disorder between prisoners with no ND traits and those with autistic traits

Mental Health Problem	No ND n=69	+ve autistic traits n= 37	X2 Sig * P<.05 Sig ** P<.00	ADOS +ve n= (11)	X2 Sig * P<.05 Sig ** P<.00
Psychosis	1, 1.4%	3, 8.1%	$\chi^2 = (n=106) 2.79, P = .095$	0, 0%	$\chi^2 = (n=80) .298, P = .585$
Affective disorders					
Depression	2, 15.4%	11, 29.7%	$\chi^2 = (n=106) 15.76, P < .001^{**}$	2, 18.2%	$\chi^2 = (n=80) 3.23, P = .072$
Major depression with psychotic features	2, 2.9%	4, 10.8%	$\chi^2 = (n=106) 2.66, P < .037$	0, 0%	$\chi^2 = (n=80) .600, P = .439$
Mania or Hypomania	3, 4.3%	8, 21.6%	$\chi^2 = (n=106) 7.34, P = .007$	1, 9.1%	$\chi^2 = (n=80) .380, P = .538$
GAD	3, 4.3%	10, 27%	$\chi^2 = (n=106) 11.03, P < .001^{**}$	2, 18.2%	$\chi^2 = (n=80) 2.30, P = .130$
Social Phobia	3, 4.3%	15, 40.5%	$\chi^2 = (n=106) 21.94, P < .001^{**}$	3, 27.3%	$\chi^2 = (n=80) 5.05, P < .025^*$
Obsessive compulsive disorder	4, 5.8%	8, 21.8%	$\chi^2 = (n=106) 5.69, P < .017$	3, 27.3%	$\chi^2 = (n=80) 4.04, P = .045^*$
Post-traumatic stress disorder (PTSD)	4, 5.8%	6, 16.2%	$\chi^2 = (n=106) 2.90, P = .089$	1, 9.1%	$\chi^2 = (n=80) .159, P = .690$
Antisocial Personality Disorder	16, 23.2%	24, 64.9%	$\chi^2 = (n=106) 17.80, P < .001^{**}$	2, 18.2%	$\chi^2 = (n=80) 1.42, P = .706$

4.4. Risk for History of Alcohol and Drug Use

There was no significant difference between the neurotypical prisoners and those with autistic traits with regards to their history of alcohol and drug abuse or dependency, although

autistic prisoners were more likely to be dependent on alcohol, whereas neurotypical prisoners more likely to have a drug dependency see table 4. None of the ADOS +ve group reported alcohol abuse and rates of dependency were much lower than the two other groups.

Table 4 - *Comparison of prisoner comorbidity and likelihood of drug/alcohol use - no ND and autistic traits*

	No ND (n=69)	+ve autistic traits n= (37)	X2 Sig * P<.05 Sig ** P<.00	ASD n= (11)	X2 Sig * P<.05 Sig ** P<.00
Alcohol dependency	7, 10.1%	8, 21.6%	$\chi^2=(n=106) 2.50, P=.114$	1, 9.1%	$\chi^2=(n=80) 0.12 P=.913$
Alcohol Abuse	2, 2.9%	0,0%	$\chi^2=(n=106) 1.74, P=.187$	0, 0%	$\chi^2=(n=80) .600 P=.439$
	12, 17.4%	12, 32.4%	$\chi^2=(n=106) 3.01, P=.083$	2, 18.2%	$\chi^2=(n=80) 0.04, P=.949$
Drug Dependency					
Drug Abuse	4, 5.8%	1, 2.7%	$\chi^2=(n=106) 056, P=.454$	0, 0%	$\chi^2=(n=80) 1.21 P=.270$

5. Discussion

We have shown in this sample, of prisoners screening positive with autistic traits were significantly more likely than neurotypical prisoners to have thought about self-harm or suicide and significantly more likely to report to have attempted suicide during their lifetime when compared to their neurotypical peers and ADOS +ve group. Prisoners with elevated levels of autistic traits were much more at risk to a of comorbid mental disorders. In addition, those prisoners with autistic traits had much higher rates of antisocial personality disorder. Many of the findings concur with previous research, for example we know those with traits of neurodevelopmental disorders in prison appear more vulnerable to a wider range of mental disorder, self-harm and suicidality (McCarthy et al., 2019). This paper examined a subset with

autistic traits and has found the same for this group of prisoners. There is the possibility that the presence of other comorbid mental disorder such mood or psychotic symptoms may have led to elevated autistic traits being identified using the AQ. However, a standardised psychiatric interview was used during the study to elicit the symptoms of specific psychiatric disorders and the items of the AQ focus on the core impairments of an autism spectrum disorder. This requires further exploration but there is an evidence base supporting the increased risk of those with autism spectrum disorder for comorbid mental disorder (Royal College of Psychiatrists, 2014, 2020).

5.1. Implications for Practice

5.1.1. Risk for self-harm and/or suicide behaviours

There is relatively little research evidence or knowledge on suicide in adults with ASD although there are case reports that may offer some insights (Richa, Fahed, Khoury, & Mishara, 2014). Also, there is limited evidence regarding suicide relating to ASD within the prison population. Estimates of suicidality in general for individuals with ASD range from 10.7–50% (Segers & Rawana, 2014). This study showed that those prisoners with autistic traits had higher rates of lifetime attempted suicide up to 65% indicating that this group is a very high-risk population coming into prison, who will require a more intensive and involved clinical input. A study of 542 prisoners in England, which employed a prediction model for self-harm showed the strongest risk factors were previous self-harm and current suicidal ideation with our findings indicating those prisoners with autistic traits falling into a group with high rates of previous self-harm behaviour. A recent rapid evidence review of self-harm by adult men in prison, published by Her Majesty's Prison and Probation Service (Pope, 2018). This review failed to identify or consider ASD as a possible risk factor or that the group were at higher risk. However, the

evidence from the findings of this study indicate that the elevated levels of autistic traits are possibly a significant risk factor for self-harm behaviour within a prison setting.

5.1.2. Comorbid mental health disorder

Much of the research on mental health needs in people with ASD comes from children and younger adults, with mood and anxiety disorders reported at higher rates in a number of studies (Bruggink, Huisman, Vuijk, Kraaij, & Garnefski, 2016) but adult studies also confirm high rates of mental health difficulties (Moss, Howlin, Savage, Bolton, & Rutter, 2015). However, there is little information from prison populations although high rates of comorbid mental health disorders in those with neurodevelopmental disorders were reported from a study at HMP Brixton (Chaplin et al., 2017; McCarthy et al., 2019; Underwood et al., 2013; Underwood et al., 2016). This current study found those with elevated levels of autistic traits were significantly more likely to have a diagnosis of depression, anxiety and personality disorders. These findings clearly indicate that there is a need not only identify whether a prisoner has ASD or autistic traits (if it is not already known) but whether that individual also has any comorbid mental health disorders as this psychological complexity may potentially have an adverse impact on their rehabilitation and reintegration (Robertson & McGillivray, 2015). In addition, mental disorders in individuals with autistic traits (such as anxiety and depression) can further exacerbate problems or difficulties they are facing within a prison setting. Again this highlights the need for more defined and involved clinical input for this group within the prison.

5.2. Limitations

The study had a number of limitations. These included it reports on only one prison. There is also a lack of psychometric data on the use of the AQ-20 and AQ-10, in prison populations. The study found that although the AQ did have the ability to discriminate ASD patients from patients without ASD, and the social skills, communication and attention switching subscales were identified as being the most sensitive. Another important issue to consider is that the use of the AQ may be limited only to individuals who possess sufficient literacy skills. A number of studies have found “extremely poor literacy skills” in prisoners (Creese, 2016). There is a need for a modified version of the AQ which could be conducted using a semi-structured interview approach within forensic settings (Murphy, 2011). Clearly, there is a need for more research looking at the validity of screening methods in prison populations and also the rates of false negatives (Silva, Gough, & Weeks, 2015). In addition, ASD screening tools have been developed (and therefore normed) based on the male phenotype which questions the validity of these tools for autistic females. Further studies are required on how best to screen for autism spectrum disorder or autistic traits in female prisoners.

The change of screening tool was not ideal but was as a response to National Policy and designed to ensure the prison had access to the latest tools as education and advice to the local prison healthcare was integral to the study as was sustainability of screening within the prison. Finally the movement of prisoners within and to other prisons was often responsible for incomplete data for MINI following screening for autistic traits.

5.3. Future Research Directions

5.3.1. Improving Health Outcomes for Prisoners with ASD including those with elevated autistic traits.

The findings from the present study clearly highlight the importance of further research to explore both the prevalence as well as the characteristics of non-suicidal self-injury (NSSI) in prisoners with autistic traits as well as suicidal behaviour. Maddox has also suggested the need for longitudinal studies to examine the potential pathways to NSSI and the associated consequences or outcomes (Maddox, Trubanova, & White, 2017) in individuals with ASD within forensic settings.

In order to further improve healthcare within the prison there needs to be increased recognition and understanding of ASD and the broader autistic phenotype, with autistic traits. There also needs to be increased understanding regarding the detection (and appropriate intervention) of comorbid mental health or behavioural problems in this group. Training for prison staff should include these areas and the training should also be tailored specifically to each of the types of prison staff (Underwood et al., 2016).

5.3.2. Experiences of individuals with ASD within the prison environment

There is a need for additional research exploring the experiences of individuals with autistic traits or broader autistic phenotype in the prison environment. This research would help inform the development and availability of effective support and protective systems for this group of prisoners. Another important step forward could be the development of specific pathways of care for those in the prison with a diagnosis of ASD (Woodbury-Smith & Dein,

2014) similar to what currently exists for individuals with personality disorders who become involved in the criminal justice system.

6. Conclusion

Prisoners with elevated levels of autistic traits did appear more vulnerable to reporting self-harm, suicidal thoughts and were more vulnerable to a range of mental disorders than neurotypical prisoners. This strengthens the case for increased awareness and access to screening and subsequent diagnosis which currently prisons are currently not set up for. There are questions around the validity and usefulness of current screening tools for ASD in forensic populations. Finally, we need more evidence on the experience of autistic prisoners to inform how pathways should work to improve health outcomes for this group of prisoners.

7. Acknowledgements

7.1. The study was funded by Guy's and St Thomas' Charity, Grant/Award Number:

G101019 and St Andrews Healthcare; Northampton, UK

8. Author contributions

8.1. EC, JMc and AF conceptualised the study. EC, JMc, AF and CA were responsible for drafting the manuscript. All authors supported the methodology and design of the study, HH, JS and EC collected data. EC and JMc analyzed the data and interpreted results.

References

- Abrahams, Brett S, & Geschwind, Daniel H. (2008). Advances in autism genetics: on the threshold of a new neurobiology. *Nature reviews genetics*, 9(5), 341-355.
- Adler, Lenard A, Spencer, Thomas, Faraone, Stephen V, Kessler, Ronald C, Howes, Mary J, Biederman, Joseph, & Secnik, Kristina. (2006). Validity of pilot Adult ADHD Self-Report Scale (ASRS) to rate adult ADHD symptoms. *Annals of Clinical Psychiatry*, 18(3), 145-148.
- Allen, David, Evans, Carys, Hider, Andrew, Hawkins, Sarah, Peckett, Helen, & Morgan, Hugh. (2008). Offending behaviour in adults with Asperger syndrome. *Journal Of Autism And Developmental Disorders*, 38(4), 748-758.
- Allison, Carrie, Auyeung, Bonnie, & Baron-Cohen, Simon. (2012). Toward brief “red flags” for autism screening: the short autism spectrum quotient and the short quantitative checklist in 1,000 cases and 3,000 controls. *Journal of the American Academy of Child & Adolescent Psychiatry*, 51(2), 202-212. e207.
- American Psychiatric Association. (2013). *DSM 5*: American Psychiatric Association.
- Bertrams, Alex. (2021). Internal reliability, homogeneity, and factor structure of the ten-item Autism-Spectrum Quotient (AQ-10) with two additional response categories. *Experimental Results*, 2. doi:10.1017/exp.2020.70
- Bruggink, A, Huisman, S, Vuijk, R, Kraaij, V, & Garnefski, N. (2016). Cognitive emotion regulation, anxiety and depression in adults with autism spectrum disorder. *Research in Autism Spectrum Disorders*, 22, 34-44.

- Brugha, Traolach S, McManus, Sally, Bankart, John, Scott, Fiona, Purdon, Susan, Smith, Jane, . . . Meltzer, Howard. (2011). Epidemiology of autism spectrum disorders in adults in the community in England. *Archives Of General Psychiatry*, 68(5), 459-465.
- Brugha, TSHJFSJ, McManus, S, Meltzer, H, Smith, J, Scott, FJ, Purdon, S, . . . Bankart, J al. (2009). Autism spectrum disorders in adults living in households throughout England: report from the Adult Psychiatric Morbidity Survey 2007. In: Health and Social Care Information Centre, Social Care Statistics, Leeds, UK.
- Chaplin, E, & McCarthy, J. (2014). Autism spectrum disorder and offending—a UK perspective. *Autism Spectrum Quarterly*, 14-16.
- Chaplin, E., McCarthy, J., Underwood, L., Forrester, A., Hayward, H., Sabet, J., . . . Murphy, D. (2017). Characteristics of prisoners with intellectual disabilities. *J Intellect Disabil Res*, 61(12), 1185-1195. doi:10.1111/jir.12441
- Cooper, Penny, & Allely, Clare. (2017). You Can't Judge a Book by Its Cover: Evolving Professional Responsibilities, Liabilities and Judgecraft When a Party Has Asperger's Syndrome. *N. Ir. Legal Q.*, 68, 35.
- Creese, Brian. (2016). An assessment of the English and maths skills levels of prisoners in England. *London Review of Education*, 14(3), 13-30.
- Dell'Osso, L, Carpita, B, Muti, D, Morelli, V, Salarpi, GIANLUCA, Salerni, ANTONIO, . . . Ballerio, M. (2019). Mood symptoms and suicidality across the autism spectrum. *Comprehensive Psychiatry*, 91, 34-38.
- Dell'Osso, L., Luche, R. D., Gesi, C., Moroni, I., Carmassi, C., & Maj, M. (2016). From Asperger's Autistischen Psychopathen to DSM-5 Autism Spectrum Disorder and Beyond:

- A Subthreshold Autism Spectrum Model. *Clin Pract Epidemiol Ment Health*, 12, 120-131. doi:10.2174/1745017901612010120
- Dell'Osso, L, Lorenzi, P, & Carpita, B. (2019). Autistic traits and illness trajectories. *Clinical Practice and Epidemiology in Mental Health: CP & EMH*, 15, 94.
- Falkmer, T., Anderson, K., Falkmer, M., & Horlin, C. (2013). Diagnostic procedures in autism spectrum disorders: a systematic literature review. *Eur Child Adolesc Psychiatry*, 22(6), 329-340. doi:10.1007/s00787-013-0375-0
- Fazel, S, & Seewald, K. (2012). Severe mental illness in 33 588 prisoners worldwide: systematic review and meta-regression analysis. *The British Journal of Psychiatry*, 200(5), 364-373.
- Im, D. S. . (2016a). Template to perpetrate: an update on violence in autism spectrum disorder. *Harvard Review of Psychiatry*, 24(1), 14.
- Im, D. S. . (2016b). Trauma as a Contributor to Violence in Autism Spectrum Disorder. . *Journal of the American Academy of Psychiatry and the Law*, 42(2), 184-192.
- Lord, Catherine, Rutter, Michael, Goode, Susan, Heemsbergen, Jacquelyn, Jordan, Heather, Mawhood, Lynn, & Schopler, Eric. (1989). Autism diagnostic observation schedule: A standardized observation of communicative and social behavior. *Journal Of Autism And Developmental Disorders*, 19(2), 185-212.
- Lord, Catherine, Rutter, Michael, & Le Couteur, Ann. (1994). Autism Diagnostic Interview-Revised: a revised version of a diagnostic interview for caregivers of individuals with possible pervasive developmental disorders. *Journal Of Autism And Developmental Disorders*, 24(5), 659-685.
- Maddox, Brenna B, Trubanova, Andrea, & White, Susan W. (2017). Untended wounds: Non-suicidal self-injury in adults with autism spectrum disorder. *Autism*, 21(4), 412-422.

- McCarthy, J, Chaplin, E, Forrester, A, Underwood, L, Hayward, H, Sabet, J, . . . Murphy, D. (2019). Prisoners with neurodevelopmental difficulties: Vulnerabilities for mental illness and self-harm. *Criminal Behaviour and Mental Health*, 29(5-6), 308-320.
- McKenzie, Karen, Michie, Amanda, Murray, Aja, & Hales, Charlene. (2012). Screening for offenders with an intellectual disability: the validity of the Learning Disability Screening Questionnaire. *Research In Developmental Disabilities*, 33(3), 791-795.
- Ministry of Justice, & Her Majesty's Prison and Probation Service,. (2021). *Prison population figures: 2021*. Retrieved from <https://www.gov.uk/government/statistics/prison-population-figures-2021>
- Moss, Philippa, Howlin, Patricia, Savage, Sarah, Bolton, Patrick, & Rutter, Michael. (2015). Self and informant reports of mental health difficulties among adults with autism findings from a long-term follow-up study. *Autism*, 19(7), 832-841.
- Murphy, David. (2011). Autism Spectrum Quotient (AQ) profiles among male patients within high security psychiatric care: comparison with personality and cognitive functioning. *Journal of Forensic Psychiatry & Psychology*, 22(4), 518-534.
- Myers, Fiona. (2004). *On the Borderline?: People with Learning Disabilities And/or Autistic Spectrum Disorders in Secure Forensic and Other Specialist Settings*.
- National Audit Office. (2009). *Supporting people with autism through adulthood. Model to assess the financial impacts of providing multi-disciplinary support services for adults with high-functioning autism/Asperger syndrome*. Retrieved from London:
- Newman, Stewart S, & Ghaziuddin, Mohammad. (2008). Violent crime in Asperger syndrome: the role of psychiatric comorbidity. *Journal Of Autism And Developmental Disorders*, 38(10), 1848.

- Özdemir, Taner, & Eyduran, Ecevit. (2005). Comparison of Chi-Square and likelihood ratio Chi-Square tests: Power of test. *Journal of Applied Sciences Research*, 1(2), 242-244.
- Pope, L. (2018). *Self-harm by adult men in prison: A rapid evidence assessment (REA)*.
Retrieved from
- Richa, Sami, Fahed, Mario, Khoury, Elias, & Mishara, Brian. (2014). Suicide in autism spectrum disorders. *Archives of Suicide Research*, 18(4), 327-339.
- Robertson, Caitlin E, & McGillivray, Jane A. (2015). Autism behind bars: a review of the research literature and discussion of key issues. *The Journal of Forensic Psychiatry & Psychology*, 26(6), 719-736.
- Robinson, Louise, Spencer, Michael D, Thomson, Lindsay DG, Stanfield, Andrew C, Owens, David GC, Hall, Jeremy, & Johnstone, Eve C. (2012). Evaluation of a screening instrument for autism spectrum disorders in prisoners. *PLoS ONE*, 7(5).
- Ronald, Angelica, & Hoekstra, Rosa A. (2011). Autism spectrum disorders and autistic traits: a decade of new twin studies. *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics*, 156(3), 255-274.
- Royal College of Psychiatrists. (2014). *Good practice in the management of autism in adults*.
Retrieved from London:
- Royal College of Psychiatrists. (2020). *The psychiatric management of autism in adults report*
Retrieved from London:
- Sabet, Jessica, Underwood, Lisa, Chaplin, Eddie, Hayward, Hannah, & McCarthy, Jane. (2015). Autism spectrum disorder, attention-deficit hyperactivity disorder and offending. *Advances in Autism*.

- Segers, Magali, & Rawana, Jennine. (2014). What do we know about suicidality in autism spectrum disorders? A systematic review. *Autism Research*, 7(4), 507-521.
- Sheehan, David V, Lecrubier, Yves, Sheehan, K Harnett, Amorim, Patricia, Janavs, Juris, Weiller, Emmanuelle, . . . Dunbar, Geoffrey C. (1998). The Mini-International Neuropsychiatric Interview (MINI): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *Journal of clinical psychiatry*, 59(20), 22-33.
- Silva, Daniel, Gough, Karen, & Weeks, Hannah. (2015). Screening for learning disabilities in the criminal justice system: a review of existing measures for use within liaison and diversion services. *Journal Of Intellectual Disabilities And Offending Behaviour*.
- Sucksmith, Edward. (2012). *The Broader Autism Phenotype in the Parents of Children With Autism Spectrum Conditions*. The Open University,
- Underwood, Lisa, Forrester, Andrew, Chaplin, Eddie, & McCarthy, Jane. (2013). Prisoners with neurodevelopmental disorders. *Journal Of Intellectual Disabilities And Offending Behaviour*, 4(1-2), 17-23.
- Underwood, Lisa, McCarthy, Jane, Chaplin, Eddie, Forrester, Andrew, Mills, Richard, & Murphy, Declan. (2016). Autism spectrum disorder traits among prisoners. *Advances in Autism*.
- Wilson, C Ellie, Roberts, Ged, Gillan, Nicola, Ohlsen, Chris, Robertson, Dene, & Zinkstok, Janneke. (2014). The NICE guideline on recognition, referral, diagnosis and management of adults on the autism spectrum. *Advances in Mental Health and Intellectual Disabilities*.

Woodbury-Smith, Marc, & Dein, Kalpana. (2014). Autism spectrum disorder (ASD) and unlawful behaviour: where do we go from here? *Journal Of Autism And Developmental Disorders*, 44(11), 2734-2741.

World Health Organization. (1992). *The ICD-10 classification of mental and behavioural disorders: clinical descriptions and diagnostic guidelines*: World Health Organization.