



Intellectual disability and autism in adults influence psychological treatments for mental health comorbidities.

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Intellectual disability and autism in adults influence psychological treatments for mental health comorbidities.

Abstract

Purpose: Mental health conditions are often underdiagnosed in adults with intellectual disability and do not always receive psychological interventions as recommended by the National Institute for Health and Care Excellent guidelines. To realise the national UK programme's aim of stopping overuse of medications in people with intellectual disability, it is important that these individuals have access to appropriate non-pharmacological interventions. We examined the relationship between an individual's level of intellectual disability and presence or absence of autism with access to relevant non-pharmacological interventions from specialist community intellectual disability services. **Methodology:** A cross-sectional study of adults accessing four specialist intellectual disability services in North West England in 2019. **Findings:** There was high prevalence of mental health comorbidity, even higher for autistic adults. However, a relatively small percentage of the study population were receiving psychological interventions. The most frequent non-pharmacological intervention was positive behaviour support plan, irrespective of comorbid mental illnesses. **Originality:** This large sample study examined the relationship between intellectual disability level and presence of autism with accessing psychological interventions. **Implications:** Not having access to psychological interventions for the treatment of mental illness could result in poor health outcomes and increasing health inequalities. The study highlights the need for developing psychological interventions particularly for those with moderate to severe intellectual disability and for those with associated autism.

Keywords

Learning Disability, PBS, STOMP, Mental illness, CBT, Anxiety management.

Article classification:

Research paper

Introduction

Mental health conditions in individuals with intellectual disability are often overlooked and underdiagnosed (Mental Health Foundation, 2016). Explanations include problems applying standard assessment approaches and falsely attributing the clinical problems to the intellectual disability rather than recognising possible comorbid mental health diagnoses (Reiss et al, 1992). In addition, people with an intellectual disability have a higher prevalence of concurrent mental health diagnoses than the general population (Cooper et al, 2007); consequently, potentially diagnosable conditions are being left untreated (Mental Health Foundation 2016), with increased barriers to accessing healthcare and specialist services (RCPsych, 2020). Overall, such individuals are more likely to have poor physical health, a greater risk of having comorbidities relating to physical and mental health conditions, and a greater risk of premature death (LeDeR, 2020).

The United Kingdom (UK) position has gradually improved over the past few decades with mental health comorbidities better understood and diagnosed in this population. However, treatment options are still not consistently delivered in line with national guidance (National Institute for Health and Care Excellence, 2020), with responses varying across geographical areas (RCPsych, 2019). Factors influencing this variation include local health service commissioning arrangements, availability of services, and the severity of the patients' intellectual disability.

For most individuals with an intellectual disability, mental health services are provided by specialist community intellectual disability teams; however, for those with a mild intellectual disability, the Equality Act 2010 (UK Parliament, 2020) and the Green Light Tool kit (National Development for Inclusion, 2017) advise that services should be provided by mainstream services rather than specialist intellectual disability services. Pathways and standards are developed and reviewed for those with a more significant degree of intellectual disability and comorbid health difficulties to ensure a more standardised approach to assessment, treatment, and care (NICE, 2016).

There are number of UK programmes that aim to improve mental health and mental health services for people with intellectual disability (Transforming Care Agenda (NHS England, 2012); Building the Right Support (NHS England, 2015); Stopping Over Medication of People: STOMP (NHS England, 2016)). These programmes contribute to the assessment, diagnosis

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3 and treatment of those with an intellectual disability, with the emphasis being placed on
4 alternatives to pharmacological interventions such as positive behaviour support plans
5 and/or psychological interventions, where appropriate to do so (Banks and Bush, 2016).
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7 Evidence suggests that many of the psychological treatments available for those with
8
9 intellectual disability concentrate mainly on those with mild intellectual disability. For those
10
11 in the moderate to severe range of intellectual disability the focus is on behaviour
12
13 management strategies (Vereenoghe and Langdon, 2013). At the same time, an increasing
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15 degree of intellectual disability correlates with increasing presence of mental health
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17 disorders (Corbett, 1979; Lund, 1985; Cooper, 2007).
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21 Our clinical experience also suggests that the effectiveness of such non-pharmacological
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23 interventions for the comorbid mental health problems differ, depending on the severity of
24
25 the intellectual disability. Furthermore, around 35,000 adults with intellectual disability are
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27 prescribed various psychotropic medications (NHS England, 2016) for which there may be
28
29 limited valid clinical justification.

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31 A national benchmarking exercise in 2019 considered the performance of intellectual
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33 disability services, outlining key areas of clinical and service practice. However, this did not
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35 examine mental health comorbidities and necessary multi-disciplinary resources to meet
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37 those needs (NHS England and Improvement, 2021)

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39 There is limited research examining the impact of severity of intellectual disability on the
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41 treatment options for co-morbid mental health problems in people with intellectual
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43 disability. Accordingly, we examined the mental health needs of, and provision of non-
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45 pharmacological treatment options for, adults with intellectual disability accessing specialist
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47 community intellectual disability services. We wanted to understand the characteristics of
48
49 this population and examine whether there were differences in the provision of non-
50
51 pharmacological interventions based on the level of intellectual disability and based on
52
53 presence or absence of autism.

54 **Methods**

55 **Study Design**

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57 This was a cross-sectional study using primary and secondary data looking at individuals
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59 attending specialist community intellectual disability services in 2019 in the UK. The selected
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3 study design allowed data collection and analysis at a single point in time. Data was
4 analysed from all individuals recorded as receiving a service from the identified specialist
5 services in 2019.
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8 9 **Participants**

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11 The study was conducted in a large UK based NHS provider of community and hospital-
12 based mental health services in the North West of England. Four community intellectual
13 disability services deliver specialist care to individuals with intellectual disability across a
14 population of approximately 1.5 million. These multi-disciplinary services have an open
15 referral system which allows anyone (professional or member of the public) to refer an
16 individual with intellectual disability to these services. Services offer a range of multi-
17 disciplinary specialist interventions and support to meet their health needs
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21 The study population included individuals aged 18 years and over who accessed specialist
22 community intellectual disability services from January to December 2019. The data was
23 extracted from the trust's electronic case-record system and anonymised.
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26 27 **Procedure**

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29 Data was extracted from the electronic records by Information Analysts and authors within
30 the organisation. Key demographics and essential information relating to diagnosis,
31 treatment and level of intellectual disability was determined as crucial to the study so was
32 extracted alongside the demographics.
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35 36 **Data Analysis**

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38 Indices of deprivation (IMD) deciles was sourced from the patient's postcode from
39 <https://imd-by-postcode.opendatacommunities.org/imd/2019>.
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42 Data variables for the study included: for baseline characteristics, gender, age, ethnicity and
43 indices of deprivation; for clinical characteristics, level of intellectual disability, presence or
44 absence of autism, and mental health comorbidities, including type of mental health
45 comorbidities based on the International Classification of Diseases – 10th edition (World
46 Health Organisation, 1993). The presence or absence of Autism, along with severity of
47 Intellectual disability was identified through diagnostic section of the electronic records,
48 along with recorded ICD-10 codes. Diagnosis and codes are recorded on to the electronic
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system by clinicians for accuracy. Data variables also included non-pharmacological interventions defined as: being on care programme approach, having a positive behaviour support plan, having psychological intervention, or having any other multi-disciplinary interventions. Extracted data was imported to Excel and StataSE statistical software of analysis [(StatCorp, 2021). Stata Statistical Software: release 17. College Station, Texas, StatCVorp LLC]. We examined the relationships between both autism and the degree of intellectual disability (as a dichotomous variable, combining moderate/severe/profound intellectual disability with mild intellectual disability separately) with mental health co-morbidities and with non-pharmacological mental health treatment options (psychological treatment offered: therapies - cognitive behavioural, relaxation, dialectical behaviour, cognitive analytic , family, systemic); being on care programme approach (a process to assess, plan, review and co-ordinate care and treatment for individuals with mental health conditions and complex needs); having a positive behaviour support plan), by relative risk and adjusted relative risk. P values < 0.01 were regarded as significant.

Results

Characteristics of adults with intellectual disability attending specialist community intellectual disability services

There were 1392 people with an intellectual disability seen in 2019, with slightly more men (56%) than women (44%); most were white British (94%), and about a quarter (27%) had an additional diagnosis of autism alongside their intellectual disability (Table 1). The lower four IMD deciles had higher representation in the study population. Mental health comorbidities were present in 54% (n=752) with mood (affective) disorder being most prevalent (15%), followed by anxiety and associated disorders (13 %), and 9% had schizophrenia or other non-mood psychotic disorders (Table 2). However, only 11% were receiving psychological intervention of any kind. With regards to other interventions, 21% had a positive behaviour support plan, 14% were on care programme approach, but only 2% had not had any multi-disciplinary input apart from psychiatry (Table 1).

Impact of level of intellectual disability on mental health co-morbidities and access to treatments

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3 In relation to level of intellectual disability, men were more likely than women to have
4 moderate to severe intellectual disability (Table 2). However, mental health co-morbidities
5 viz. schizophrenia and other non-mood psychotic disorders, mood (affective) disorders, and
6 anxiety disorders were more common in those with mild intellectual disability (Table 2).
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10 There was no difference in psychological interventions based on the level of intellectual
11 disability; however, those with moderate and severe learning disability were more likely to
12 be on the care programme approach or have a positive behaviour support plan (Table 1).
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15 Having a diagnosis of schizophrenia and other non-mood psychotic disorders, or of mood
16 (affective) disorder, or that of anxiety disorder resulted in less multi-disciplinary input in
17 those with moderate to severe intellectual disability (Table 3)
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21 22 *Impact of presence of autism on mental health co-morbidities and access to treatments*

23

24 Men were 1.5 times more likely than women to have autism in addition to intellectual
25 disability. Mental health co-morbidities were almost seven times more prevalent in autistic
26 adults with intellectual disability compared to intellectual disability alone (Table 2). They
27 were more likely to have behavioural disorders starting in childhood and adolescence (51%),
28 followed by anxiety disorders (44%).
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34 When it came to non-pharmacological interventions (Table 1), autistic adults with
35 intellectual disability were more likely to have psychological intervention, be on care
36 programme approach, and have positive behaviour support plan. However, in relation to
37 individual co-morbidities, those with anxiety disorders or behavioural disorders starting in
38 childhood were more likely to have these interventions (Table 3).
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44 **Discussion**

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46 We assessed the relationship between characteristics of adults with intellectual disability
47 attending specialist community intellectual disability services and types of non-
48 pharmacological interventions. There were four key findings.
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52 First, there was high prevalence of mental health co-morbidities in the study population.
53 Community intellectual disability services are specialist services set up to meet mental
54 health needs of adults with intellectual disability. They are also set up to support meeting
55 physical health needs of this population through direct interventions (e.g. dysphagia care,
56 postural care), and through health facilitation to improve access to generic health services.
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3 This is reflected in the prevalence rate. In addition, autistic adults with intellectual disability
4 and adults with mild intellectual disability were more likely to have mental health co-
5 morbidities. Anxiety disorders and behavioural disorders with onset in childhood and
6 adolescence were more prevalent in autistic adults with intellectual disability while
7 schizophrenia and other non-mood psychotic disorders, mood (affective) disorders, and
8 anxiety disorders were more prevalent in those with mild intellectual disabilities. These
9 finding were in line with the literature (Reid *et al.*, 2001) and showed that the study cohort
10 was not unusual.
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18 Second, although there was high prevalence of mental health co-morbidities in the study
19 population, a relatively small percentage were receiving direct psychological intervention
20 (cognitive behaviour therapy, relaxation, dialectical behaviour therapy, cognitive analytical
21 therapy, family therapy, or systemic therapy). Considering the high prevalence of anxiety
22 and mood disorders in the study population, access to psychological treatments did not
23 reflect likely adherence to NICE guidelines (NICE, 2016) for treatment of these conditions. It
24 is possible that this was due to the limited availability of resources to offer the full range of
25 psychological interventions. It is also possible that some were not considered suitable for
26 specific one to one psychological intervention, either due to the level of intellectual
27 disability or presence of autism. Another explanation is that the focus for non-
28 pharmacological intervention might be more on developing formulations and positive
29 behaviour support plans. In recent years, there has been an added focus on providing
30 positive behaviour support to manage behaviours that challenge (Gore *et al.*, 2013).
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43 Third, the commonest non-pharmacological intervention was a positive behaviour support
44 plan. This was used more for autistic adults with intellectual disability compare to those
45 with intellectual disability alone. Despite the higher prevalence of mental health co-
46 morbidities in autistic adults with intellectual disability, they were more likely to get positive
47 behaviour support plan as an intervention than psychological intervention. Again, this was
48 not keeping in with NICE guidelines for the management of mental health comorbidities
49 (NICE, 2016). Autistic adults with intellectual disability present with a range of mental health
50 difficulties, needing a range of psychological interventions. At the same time, autistic adults
51 are not likely to benefit from behaviour management strategies alone, aimed at behaviours
52 that challenge, when the underlying issue could be due to mental illness.
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3 Fourth, autistic adults with intellectual disability and adults with moderate to severe
4 learning disability were more likely to be on the care programme approach. The care
5 programme approach, with an allocated care coordinator and associated care plan, allows
6 services to manage risks better, due to an individual's mental health needs. Considering the
7 high level of mental health co-morbidity in autistic adults with intellectual disability, a higher
8 use of the care programme approach was expected. At the same time, it is interesting that
9 the care programme approach was more likely to be used in those with moderate to severe
10 intellectual disability than those with mild intellectual disability. Since our data suggested
11 higher prevalence of mental health comorbidity in those with mild intellectual disability, it is
12 possible that those with mild intellectual disability get a diagnosis of mental illness (and
13 appropriate treatments including medications) and, in many cases, do not reach threshold
14 for care programme approach. On the other hand, those with moderate to severe
15 intellectual disability are more likely to present with a complex clinical picture including
16 behaviours that challenge, thus needing a care programme approach.

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29 There are three clinical implications and recommendations arising from study findings.

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32 First, adults with intellectual disability did not get enough access to psychological
33 interventions based on NICE guidelines, despite high co-morbidity of mental health
34 conditions. This means that pharmacological treatments continue to remain the mainstay of
35 managing mental health conditions in this population. It also means that in the absence of
36 recommended psychological interventions, adults with intellectual disability are likely to
37 need higher dosage of psychotropic medications and for longer duration. This could result in
38 further worsening of life expectancy and increasing health inequalities for this group.

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44 Although there is a clear national drive to stop overuse of medications in adults with
45 intellectual disability, strategies have often focused on using positive behaviour support
46 plans to manage behaviours that challenge. Along with these strategies, services should also
47 focus on treating mental health conditions with psychological interventions.

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Second, autistic adults with intellectual disability were at significantly higher risk of mental health comorbidities and yet the focus of non-pharmacological intervention was positive behaviour support plans. Considering the heterogenous nature of autism and the additional complexity that intellectual disability and mental health co-morbidities bring, it is somewhat simplistic to attempt to meet the needs of this population using positive behaviour support

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3 plans alone. There are number of models that try to understand the needs of autistic people
4 e.g. strengths and needs frameworks using thinking pattern profiles (Tollerfield *et al*, 2021).
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6 There is a need for developing therapeutic interventions based on such models.
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9 Third, the literature indicates that there is limited evidence for the effectiveness of
10 psychological interventions based on the NICE guidelines in adults with intellectual
11 disability. Most of the available evidence focussed on those with mild intellectual disability.
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13 Many of these treatments were adapted from generic mental health services and were not
14 specifically developed for treating adults with intellectual disability. Moreover, it is possible
15 that the adaptations needed for those with intellectual disability could be different from
16 those for autistic adults with intellectual disability. Considering the heterogenous nature of
17 the study population, it is possible that this cohort could benefit from multi-modal therapy.
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19 There is some emerging evidence for use of multi-modal therapy (Antochi *et al*, 2003) and
20 this needs further exploration and research. Due to the presentation of the target
21 population, there are however, potential barriers relating to engagement in psychosocial or
22 psychological therapies via a multi-modal therapy approach. There are also probable issues
23 relating to consent to treatment due to cognitive limitations. An additional
24 recommendation would be to ensure and establish a more robust, thorough understanding
25 of presentation and associated diagnosis (inclusive of Mental Health comorbidities) through
26 initial assessment when entering the service. Due to the risk and implications of diagnostic
27 overshadowing, ensuring a more accurate identification of potential associated disorders
28 and implications would allow for better understanding of need. This would then permit for
29 better service evaluation and need inclusive of the potential adaptation of traditional
30 therapy offers recommended by NICE or the development of alternative offers to meet the
31 needs of the population.
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48 There are several strengths of this study. The study cohort included a large number of adults
49 with intellectual disability from four different service areas with data on a wide variety of
50 variables giving enough power for multifactorial statistical analysis. In addition, the study
51 used a robust level for statistical significance. The conduct and reporting of the study were
52 in accordance with STROBE guidelines (2007).
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58 There were, however, some limitations. We used routinely collected data that was extracted
59 from the electronic patient record system. The quality of the data was affected by potential
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3 variations in data input by clinical staff; this made it difficult to make associations between
4 mental health co-morbidities and types of intervention provided. We were not able to
5 examine specific interventions provided by wider multi-disciplinary team members including
6 nursing, speech and language therapists, physio therapists, and occupational therapists.
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8 Although there was a significant amount of multi-disciplinary input provided to this cohort,
9 we were not able to assess whether this was towards meeting mental health needs of the
10 population or towards supporting with physical health issues. As previously highlighted,
11 individuals with a Mild Intellectual Disability largely access mainstream mental health
12 services rather than specialist Intellectual Disability Services which will be inclusive of
13 psychological or non-pharmacological treatment options recommended by NICE. One of the
14 limitations of this study is data from that particular population was not analysed to examine
15 the relationship between Mild Intellectual Disability and the uptake, engagement or
16 outcome of alternative interventions to medication in the organisations mainstream mental
17 health services. This could be further investigated to understand the need of this
18 population, engagement and success of treatment options.
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31 **Conclusion**

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33 We demonstrated a high prevalence of mental health co-morbidities in adults with an
34 intellectual disability within the identified study population. Nevertheless, a relatively small
35 percentage of the study population received the recommended psychological interventions
36 as outlined in NICE guidelines. Positive Behaviour Support was the most common
37 intervention irrespective of the high prevalence of mental illness comorbidities. Addressing
38 this will help towards improving health outcomes and reducing health inequalities.
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48 **Ethical Information**

49 The study was approved through the Trust's research ethics approval process. Data was
50 extracted and anonymised from the standard electronic patient record system used in
51 routine clinical care. According to the Health Research Authority algorithm (see
52 <http://www.hra-decisiontools.org.uk/research/>) this study was not defined as research and
53 therefore did not require submission to the Integrated Research Application System (a
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single system for applying for the permissions and approvals for health and social care / community care research in the UK).

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Advances in Mental Health & Intellectual

Annex 1: List of data variables, their meanings, sources of the Data

Data Variable	Descriptor	Source of Data
Gender	M, F, Transgender, Other, Missing	Electronic patient record (EPR)
Age	Age in years, Missing	EPR: total age 18+
Ethnicity	White, Asian, Black, Mixed, other, missing	EPR
IMD	IMD number based on postcode	EPR
Diagnosis of Intellectual Disability	Mild/Moderate, Severe/Profound, missing	EPR
Diagnosis of Autism	Yes / No / Missing	EPR
Open to CLDT	Yes / No / Missing	EPR
On CPA	Yes /No /Missing	EPR
Mental Health Comorbidities	Yes /No / Missing	EPR Clinic Letters Care plan
Type of Mental Health Comorbidities	F00-F09 F10-F19 F20-F29 F30-F39 F40-F49 F50-F50 F80-F89 F90-F99	EPR Clinic Letters Care plan
Treatment offered	Yes / No/ Missing	EPR Clinic Letters

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		Care plan
Treatment delivered	Yes/ No/ Missing	EPR Clinic Letters Care plan

Advances in Mental Health & Intellectual

Table 1 Demographics of people with intellectual disability in 2019

	Total	(%)	Moderate / Severe ID	(%)	RR	95% CL	P	ID with autism	(%)	RR	95% CL	P
Male	776	(56)	493	(64)	1.1	1.0-1.2	0.0041	243	(31)	1.5	1.3-1.8	<0.0001
Female	616	(44)	344	(56)				128	(21)			
White British	1308	(94)	784	(60)	0.9	0.8-1.1	0.341	346	(26)	1.7	1.1-2.8	0.0164
Non-white British	84	(06)	36	(43)				17	(20)			
Psychological intervention	159	(11)	81	(51)	1.1	1.0-1.2	0.2182	58	(36)	1.4	1.2-1.8	0.0017
No psychological intervention	1233	(89)	474	(38)				313	(25)			
CPA	193	(14)	107	(55)	1.4	1.3-1.6	<0.0001	87	(45)	1.9	1.6-2.3	<0.0001
No CPA	1199	(86)	448	(37)				284	(24)			
PBS	292	(21)	101	(35)	1.3	1.2-1.5	<0.0001	141	(48)	2.3	2.0-2.7	<0.0001
No PBS	1100	(79)	454	(41)				230	(21)			
MDT yes	1361	(98)	539	(40)	1.1	0.8-1.6	0.4886	361	(27)	0.9	0.5-1.5	0.663
No MDT	30	(2)	16	(53)				9	(30)			
IMD 2019 Decile 1-2	681	(49)	372	(55)	0.9	0.8-0.96	0.0065	159	(23)	1.1	0.9-1.5	0.3798
IMD 2019 Decile 9-10	243	(17)	156	(64)				50	(21)			

Notes: CL = lower confidence interval; CPA = care programme approach; IMD = Index of Multiple Deprivation; MDT = multidisciplinary team; p = level of statistical significance; PBS = positive behaviour support; RR = relative risk. P values in bold are significant at 0.01 level.

Table 2 Mental health co-morbidities of persons with intellectual disability in 2019

	Total	ID mod / sev	%	RR	P	aRR	95% LCI	95% UCL	P	ID with autism	%	RR	P	aRR	95% LCI	95% UCL	P
<i>Overall comorbidity effect</i>																	
Mental health comorbidity present	752	391	(52)	0.7	<0.0001					330	(44)	6.9	<0.0001				
No comorbidity	640	446	(70)							41	(6)						
<i>Presence of ICD10 diagnoses</i>																	
F00-F09	57	38	(67)	1.1	0.2627					2	(4)	0.1	0.003				
None	1335	799	(60)							369	(28)						
F10-F19	23	2	(9)	0.1	0.004					2	(9)	0.3	0.0948				
None	1369	835	(61)							369	(27)						
F20-F29	127	39	(31)	0.5	<0.0001	0.5	0.4	0.6	<0.0001	22	(17)	0.4	<0.0001	0.7	0.5	1.0	0.07
None	1265	798	(63)							349	(28)						
F30-F39	211	96	(46)	0.7	<0.0001	0.7	0.6	0.8	<0.0001	54	(26)	1.0	0.7071				
None	1181	741	(63)							317	(27)						
F40-F49	186	88	(47)	0.8	0.0007	0.8	0.7	0.9	0.001	81	(44)	1.8	<0.0001	2.0	1.7	2.5	<0.0001
None	1206	749	(62)							290	(24)						
F50-F59	7	4	(57)	0.95	0.876					4	(57)	2.2	0.02				
None	1385	833	(60)							367	(27)						
F60-F69	39	0	(0)							7	(4)	0.7	0.2411				
None	1353	837	(62)							364	(28)						
F90-F99	91	46	(51)	0.8	0.0817					46	(9)	2.0	<0.0001	2.2	1.8	2.8	<0.0001
None	1301	791	(61)							325	(27)						

ICD10 comorbidities: F00-F09 = organic mental disorders; F10-F19 = disorders due to psychoactive substance misuse; F20-F29 = schizophrenia and non-mood psychotic conditions; F30-F39 = mood disorders; F40-F49 = anxiety disorders; F50-F59 = adult-onset behavioural disorders; F60-F69 = personality disorders; F90-F99 = behavioural disorders starting in childhood and adolescence. The following comorbidities were not included in the table since they duplicate information: F70-F70 =intellectual disorders; F80-F89 = psychological development disorders including autism.

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Notes: ID mod / sev = intellectual difficulty moderate or severe; LCL = lower confidence interval; p = level of statistical significance; RR = relative risk; UCL = upper confidence interval. P values in bold are significant at 0.01 level.

Advances in Mental Health & Intellectual

Table 3 Relationship between significant comorbidities and treatment options in persons with intellectual disability in 2019

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ICD10 code	Total	ID mod / sev		RR	95% CL	P	Total	ID mod/ sev		RR	P	aRR	95% CL	P	Total	ID mod / sev		RR	P	aRR	95% CL	P	
		%						%								%							
Intellectual Disability only																							
Psychology Treatment							Positive Behaviour Support						Multidisciplinary Team input										
Psychosis F20-F29	11	5	(45)	0.9	0.5-1.8	0.8104	18	8	(44)	0.7	0.1271				122	38	(31)	0.5	<0.0001	0.5	0.4-0.7	<0.0001	
None	148	73	(49)				274	183	(67)						1240	785	(63)						
Mood F30-F39	29	15	(52)	1.1	0.7-1.6	0.7457	55	37	(67)	1	0.7422				209	96	(46)	0.7	0.0001	0.7	0.6-0.8	<0.0001	
None	130	63	(48)				237	154	(65)						1153	727	(63)						
Anxiety F40-F49	28	14	(50)	1.0	0.7-1.5	0.9118	49	27	(55)	0.8	0.1372				181	86	(48)	0.8	0.0008	0.8	0.7-0.9	0.001	
None	131	64	(49)				243	164	(67)						1181	737	(62)						
Behavioural F90-F99	20	9	(45)	0.9	0.5-1.5	0.7075	34	21	(62)	0.9	0.6492				89	45	(51)	0.8	0.0769				
None	139	69	(50)				258	170	(66)						1273	778	(61)						
Intellectual Disability plus Autism																							
Psychology Treatment							Positive Behaviour Support						Multidisciplinary Team input										
ICD10 code	Total	ID with autism	%	RR	95% CL	P	Total	ID with autism	%	RR	P	aRR	95% CL	P	Total	ID with autism	%	RR	P	aRR	95% CL	P	
Psychosis F20-F29	14	5	(36)	1.1	0.5-2.2	0.8535	20	10	(50)	1.1	0.6798				130	23	(18)	0.7	0.1176				
None	180	60	(33)				295	134	(45)						1534	368	(24)						
Mood F30-F39	30	11	(37)	1.1	0.7-1.9	0.6511	56	21	(38)	0.8	0.2004				217	57	(26)	1.1	0.295				
None	166	54	(33)				259	123	(47)						1447	334	(23)						
Anxiety F40-F49	33	18	(55)	1.9	1.3-2.8	0.0015	52	33	(63)	1.5	0.0014	1.4	1.1-1.8	0.002	198	84	(42)	2.0	<0.0001	1.9	1.6-2.3	<0.0001	
None	163	47	(29)				263	111	(42)						1466	307	(21)						
Behavioural F90-F99	23	12	(52)	1.7	1.1-2.7	0.0207	35	24	(69)	1.6	0.0004	1.5	1.2-2.0	0.001	101	51	(50)	2.3	<0.0001	2.1	1.7-2.6	<0.0001	

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None	173	53 (31)	280	120 (43)	1563	340 (22)
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Notes: aRR = adjusted relative risk; ICD10 = International Coding of Disease v10; ID mod / sev = moderate or severe intellectual disability; LCL = lower confidence interval; p = level of statistical significance; RR = relative risk; UCL = upper confidence interval. P values in bold are significant at 0.01 level.

