APPENDIX 14: CLINICAL STUDY CHARACTERISTICS

1.1 CASE IDENTIFICATION INSTRUMENTS

1.1.1 Characteristics of included studies

Study ID	ALLISON2011
Bibliographic reference	Allison, C. & Baron-Cohen, S. Towards brief 'red flags' for autism screening: the short AQ and the short Q-CHAT in 1000 cases and 3000 controls. Unpublished.
Clinical features and settings	**Recruitment:** Adults with ASC recruited from as volunteers from www.autismresearchcentre.com Control data collected at the Cambridge Psychology website fro volunteers www.cambridgepsychology.com **Country:** UK
Participants	**N=** 1287 (ASC = 449; Controls = 838) **Age:** 32.93 (SD 12.20) - 35.62 (SD 13.04) across groups **Sex:** 569 M: 718 F **Ethnicity:** Not stated **Intellectual Ability:** Not stated
Study design	Cross-sectional
Target condition and reference standard(s)	Aspergers or high-functioning autism (AS/HFA) by DSM-IV **Coexiting Conditions:** None reported
Index and comparator tests	**1.Instrument** Autism-Spectrum Quotient (AQ) - 10 item version **2.Reference Standard** DSM-IV criteria **Assessors** **1.Instrument** Self-report **2.Reference Standard** Medic or clinical psychologist
Follow-up	
Index cut-off	6+
Limitations	• Analyses is retrospective and data on AQ was produced post-diagnosis. This might mean the participants were more aware of symptoms and hence answered as expected. • Method of data collection varied between groups (e.g. by post, online etc) • Diagnosis was not validated by the research team and only available data on diagnosis was utilised
Source of funding	Big Lottery Fund, the MRC, the Three Guineas Trust, the CLAHRC
Notes	10 most discriminating items of AQ were:- Attention to detail (Items 5 & 28); Attention Switching (Items 32 & 37); Communication (Items 27 & 31); Imagination (Items 20 & 41); Social (Items 36 & 45)

Study ID	BARONCOHEN2001
Bibliographic reference	Baron-Cohen, S., Wheelwright, S., Skinner, R., *et al*. (2001) The autism-spectrum quotient (AQ): evidence from asperger syndrome/high functioning autism, males and females, scientists and mathematicians. *Journal of Autism and Developmental Disorders, 31*, 5-17.
Clinical features and settings	**Recruitment:** Group 1 Recruited via National Autistic Society (UK), specialist clinics, and advertisements in news letters and WebPages Group 2 recruited from a random sample sent the AQ by post. Group 3 was a random sample of students sent the AQ Group 4 were winners of a Mathematics Olympiad **Country:** UK
Participants	**N=** Total N = 1088 Group 1 ? 58 adults with AS/HFA Group 2 ? 174 randomly selected adults Group 3 ? 840 Cambridge University Students Group 4 ? 16 winners of UK Mathematics Olympiad **Age:** Group 1 ? Mean age = 31.6 years; SD=11.8, range = 16.5 ? 58.3 Group 2 ? Mean age = 37 years, SD = 7.7, range = 18.1-60.0 Group 3 ? Mean age = 21 years, SD = 2.9, range = 17.6 ? 51.1 Group 4 ?Mean age = 17.4 years, SD = 1.0, range = 15.3 ? 18.7 **Sex:** Group 1: 45 M, 13 F Group 2: 76 M, 98 F Group 3: 454 M, 386 F Group 4: 15 M, 1 F **Ethnicity:** Mixed (not specified) **Intellectual Ability:** Group 1 ? Normal range N=15 randomly selected to come to the lab for intellectual assessment using the WAIS-R. Prorated IQ of at least 85 (normal range), mean = 106.5, SD = 8.0 Group 2 ? 15 randomly selected to come to the lab for intellectual assessment using the WAIS-R. IQ mean = 105.8, SD = 6.3 (not significantly different from group 1, p>.5) Group 3 ? Unclear Group 4 ? Unclear
Study design	Cross-sectional (Group 1 - unclear; Group 2/3 - randomly selected; Group 4 - participants in a pre-defined group)
Target condition and reference standard(s)	Aspergers or high-functioning autism (AS/HFA) by DSM-IV **Coexisting conditions:** None reported
Index and comparator tests	**1.Instrument** Autism-Spectrum Quotient (AQ) **2.Reference Standard** DSM-IV criteria **Assessors** **1.Instrument** Self-report **2.Reference Standard** Clinicians
Follow-up	
Index cut-off	32+
Limitations	False negative in controls could not be determined as the majority of questionnaires were completed anonymously
Source of funding	MRC, McDonnell-Pew Foundation, and Three Guineas Trust

Notes	
Study ID	BERUMENT1999
Bibliographic reference	Berument, S.K., Rutter, M., Lord, C., *et al*. (1999) Autism screening questionnaire: diagnostic validity. *British Journal of Psychiatry, 175*, 444-451.
Clinical features and settings	**Recruitment:** Postal questionnaire to individuals whom had participated in previous studies **Country:** UK
Participants	**N=**200 (160 = PDD, 40 = non-PDD diagnosis) **Age:** Ranged from 4-40 years across diagnosis. Mean ages for Autism = 23.08 (SD = 8.7), Atypical Autism = 7.03 (SD = 7.01), Asperger syndrome = 17.03 (SD = 4.09) **Sex:** Ratios: Autism 2.8 M: 1 F; other PDD 6.7 M: 1 F **Ethnicity:** Not stated **Intellectual Ability:** Although mental retardation was separated out, IQ ranged from 30 to > 70 across the groups (see paper for more detail) NOTE:- Non-PDD comprised of Conduct disorder (n=10), specific developmental disorder (n=7), mental retardation (n=15, other ?e.g. anxiety (n=8)
Study design	Cross-sectional (individuals had participated in previous studies)
Target condition and reference standard(s)	Diagnosis: ADI/ADI-R PDD:- Autism (n=83), Atypical Autism (n=49), Asperger's syndrome (n=16), Fragile X (n=7), Rett syndrome (n=5) **Coexisting conditions:** None reported
Index and comparator tests	**1.Instrument** Autism Screening Questionnaire(ASQ) **2.Reference Standard** ADI (n=77), ADI-R (n=123) ? measured several years before study **Assessors** **1.Instrument** Unclear - postal questionnaire so might have been parental or self-report **2.Reference Standard** Clinicians (?) NOTE@- ASQ Now named Social Communications Questionnaire (SCQ)
Follow-up	
Index cut-off	Cut-off 15+ (autism vs other diagnosis) Also suggest 22+ (autism vs. other PDDs)
Limitations	
Source of funding	Medical Research Council
Notes	

Study ID	KRAIJER2005
Bibliographic reference	Kraijer, D. & de Bildt A. (2005) The PDD-MRS: an instrument for identification of autism spectrum disorders in persons with mental retardation. *Journal of Autism and Developmental Disorders, 35*, 499-513.
Clinical features and settings	**Recruitment:** Residential institutions and day care centres **Country:** The Netherlands
Participants	**N=** 1230 (408 PDD, 696 non-PDD,126 doubtful PDD) **Age:** Range 2-80 years **Sex:** 719 M, 511 F. **Ethnicity:** Not stated **Intellectual Ability:** Mild to profound intellectual disability
Study design	
Target condition and reference standard(s)	**Diagnosis:** PDD with DSM-III-R **Coexisting conditions:** Mental retardation (mild to profound), additional congenital impairments, Downs syndrome , Fragile X)
Index and comparator tests	**1.Instrument** Pervasive Developmental Disorder in Mentally Retarded Persons (PDD-MRS) **2.Reference Standard** Reported diagnosis base on clinical classification and classification by means of scale **Assessors** **1.Instrument** Unclear **2.Reference Standard** Unclear
Follow-up	
Index cut-off	10+
Limitations	Sub-group analysis revealed poor sensitivity and specificity as well as misclassification rate for those with borderline intellectual functioning Additionally, poor specificity and overall misclassification rate for those who are blind/severe visual impairments
Source of funding	Not stated
Notes	

Study ID	KURITA2005
Bibliographic reference	Kurita, H., Koyama, T. & Osada H. (2005) Autism-spectrum quotient-Japanese version and its short forms for screening normally intelligent persons with pervasive developmental disorders. *Psychiatry and Clinical Neurosciences, 59*, 490-496.
Clinical features and settings	**Recruitment:** Outpatients at the Child Guidance Clinic affiliated with the National Welfare Foundation for Disabled Children **Country:** Japan
Participants	**N=** 240 (25 HPDD, 215 controls) **Age:** HPDD Mean = 24.2 years; Control Mean = 30.4 years **Sex:** 111 M, 130 F. **Ethnicity:** Japanese **Intellectual Ability:** Normal intelligence
Study design	Cross-sectional (Control Group = stratified two-way random sample; HFPDD group = unclear)
Target condition and reference standard(s)	**Diagnosis:** High functioning pervasive developmental disorder (HPDD) (n=13 Asperger syndrome, n=5 autistic disorder, n=7 PDD-NOS) with DSM-IV & ICD-10 (fro PDD-NOS) **Coexisting conditions:** None stated
Index and comparator tests	**1.Instrument** Autism-Spectrum Quotient (AQ) (Japanese version) **2.Reference Standard** DSM-IV clinical diagnosis **Assessors** **1.Instrument** Experienced Psychologist **2.Reference Standard** A team of clinicians
Follow-up	
Index cut-off	Different cut-offs evaluated 50 item AQ cut-off = 26 21 item AQ cut-off = 12 10 item AQ cut-off = 7
Limitations	
Source of funding	Not stated
Notes	

Study ID	VOLKMAR1988
Bibliographic reference	Volkmar, F.R., Cicchetti, D.V., Dykens, E., *et al*. (1988) An evaluation of the autism behavior checklist. *Journal of Autism and Developmental Disorders, 8*, 81-97.
Clinical features and settings	**Recruitment** Participants recruited from university-affiliated school for autistic individuals, a residential facility for mentally retarded and a clinic for children with developmental disabilities **Country:** Sweden
Participants	**N=** 157 (94 autistic, 63 non-autistic) **Age:** Mean age 19.72 years (SD 12.60) **Sex:** 121 M, 36 F. **Ethnicity:** Not stated **Intellectual Ability:** Mean IQ on Stanford Binet (for 147 participants) = 36.80 (SD 24.30). Sample included both profoundly retarded (n=47) and some with average scores (n=14)
Study design	
Target condition and reference standard(s)	**Diagnosis:** Infantile Autism with DSM-III Non-autistic group included mental retardation, atypical pervasive developmental disorder, language disorder, schizophrenia of childhood onset **Coexisting conditions:** None stated
Index and comparator tests	**1.Instrument** Autism Behavior Checklist (ABC) **2.Reference Standard** DSM-III clinical diagnosis (prior to scoring and analysis of ABC) **Assessors** **1.Instrument** Teachers & Parents **2.Reference Standard** Clinicians
Follow-up	
Index cut-off	57+
Limitations	
Source of funding	In part by William T. Grant Foundation, the John Merck Fund, MHCRC Grant 30929, CCRC Grant RR00125, NICHD Grant HD-03008, NIMH Grant MH00418, and Mr Leonard Berger
Notes	

Study ID	WAKABAYASHI2005
Bibliographic reference	Wakabayashi, A., Baron-Cohen, S., Wheelwright, S., *et al.* (2006) The autism-spectrum quotient (AQ) in Japan: a cross-cultural comparison. *Journal of Autism and Developmental Disorders, 36*, 263-270.
Clinical features and settings	**Recruitment:** HFA sample recruited via Japanese Autistic Society, specialist clinics and self-help groups Control Group randomly selected from general population and sent a postal questionnaire Students recruited from 5 universities in or near Tokyo **Country:** Japan
Participants	**N=** 1301 (Group 1: HFA = 57, Group 2: Control = 194, Group 3: Students = 1050 **Age:** Group 1 Mean age = 26.9 years (SD 7.88, range = 18-57) Group 2 Mean age = 33.6 years (SD 6.2, range 22-56) Group 3 Mean age = 20.3 (SD = 1.9, range = 18-41) **Sex:** Group 1 44 M, 13 F; Group 2 103 M, 91 F, Group 3 555 M, 495 F **Ethnicity:** Not stated **Intellectual Ability:** HFA group assumed to have IQ in normal range as had completed high school and some had a university degree
Study design	Cross-sectional (group 1 - unclear; group 2 - randomly, group 3 - unclear)
Target condition and reference standard(s)	**Diagnosis:** High Functioning Autism or Aspergers Syndrome (HFA) with DSM-IV **Coexisting conditions:** None stated
Index and comparator tests	**1.Instrument** Autism-Spectrum Quotient (AQ) **2.Reference Standard** DSM-IV clinical diagnosis **Assessors** **1.Instrument** Self-report **2.Reference Standard** Clinical Reports
Follow-up	
Index cut-off	33+
Limitations	
Source of funding	Medical Research Council
Notes	

Study ID	WOODBURYSMITH2005
Bibliographic reference	Woodbury-Smith, M.R., Robinson, J., Wheelwright, S., *et al*. (2005) Screening adults for Asperger syndrome using the AQ: a preliminary study of its diagnostic validity in clinical practice. *Journal of Autism and Developmental Disorders, 35*, 331-335.
Clinical features and settings	**Recruitment:** Cambridge Lifespan Asperger Syndrome Service **Country:** UK
Participants	**N=** 100 patient referrals **Age:** Median age = 32 years, range 18-69 **Sex:** 4:1 M/F ratio **Ethnicity:** Not stated **Intellectual Ability:** Not stated - but people with learning disabilities were excluded
Study design	cross-sectional (consecutive sample)
Target condition and reference standard(s)	**Diagnosis:** Asperger Syndrome or Autism with DSM-IV **Coexisting conditions:** None stated
Index and comparator tests	**1.Instrument** Autism-Spectrum Quotient **2.Reference Standard** DSM-IV clinical interview **Assessors** **1.Instrument** Self-report **2.Reference Standard** Two clinicians
Follow-up	
Index cut-off	26+
Limitations	Clinicians not blind to AQ score as AQ is used as part of clinical practice
Source of funding	The Three Guineas Trust supports the Cambridge Lifespan Asperger Syndrome. SBC and SW supported by Medical Research Council
Notes	

1.1.2 Characteristics of excluded studies

FERRITER2001

Reason for exclusion	No available data and the paper is a brief report with not enough information about the study. No access to full paper.

GARFIN1988

Reason for exclusion	No sensitivity and specificity data available.

MESIBOV1989

Reason for exclusion	No sensitivity and specificity data, reference standard is not adequate, age of sample (15.9 years) is outside the scope.

NYLANDER2001

Reason for exclusion	The sensitivity and specificity data in unreliable. Not all participants had a clear diagnosis.

1.1.3 References of excluded studies

FERRITER2001
Ferriter, M., Hare, D., Bendall, P., *et al*. (2001) Brief report: assessment of a screening tool for autistic spectrum disorders in adult population. *Journal of Autism and Developmental Disorders, 3*, 351-353.

GARFIN1988
Garfin, D. G. & McCallon, D. (1988) Validity and reliability of the childhood autism rating scale with autistic adolescents. *Journal of Autism and Developmental Disorders, 18*, 376-378.

MESIBOV1989
Mesibov, G. B., Schopler, E., Schaffer, B., *et al*. (1989) Use of the childhood autism rating scale with autistic adolescents and adults. *Journal of American Academy of Child and Adolescent Psychiatry, 28*, 538-541.

NYLANDER2001
Nylander, L. & Gillberg, C. (2001) Screening for autism spectrum disorders in adult psychiatric out-patients: a preliminary report. *Acta Psychiatrica Scandinavica, 103*, 428-434.

1.2 ASSESSMENT INSTRUMENTS

1.2.1 Characteristics of included studies

Study ID	BARONCOHEN2005
Bibliographic reference	Baron-Cohen, S., Wheelwright, S., Robinson, J., *et al*. (2005) The Adult Asperger Assessment (AAA): a diagnostic method. *Journal of Autism and Developmental Disorders, 35*, 807-819.
Clinical features and settings	**Recruitment:** Patients attending the Cambridge Lifespan Asperger Syndrome Service (CLASS) **Country:**UK
Participants	**N=** 42 **Age:** Mean 34.1 years (SD = 10.6 years) **Sex:** Ration = 9:1 M:F (28 M: 3 F) **Ethnicity:** **Intellectual Ability:** Normal range
Study design	Cross sectional
Target condition and reference standard(s)	**Diagnosis:** DSM-IV Asperger syndrome & High-Functioning Autism **Coexisting conditions:** None stated
Index and comparator tests	**1.Instrument** Adult Asperger Assessment (AAA) **2.Reference Standard** DSM-IV criteria **Assessors** **1.Instrument** Clinical psychologist or consultant psychiatrist & a clinician psychologist **2.Reference Standard** Clinical psychologist or consultant psychiatrist & a clinician psychologist
Follow-up	
Limitations	• Same assessors completed the AAA and DSM-IV criteria
Source of funding	Three Guineas Trust; Medical Research Council; Lifespan Healthcare NHS Trust; Cambridgeshire and Peterborough Mental Health Partnership NHS Trust
Notes	• Each patient accompanied by at least one parent as an informant • Patients also completed the Autism-Spectrum Quotient (AQ) and the Empathy Quotient (EQ)

Study ID	DZIOBEK2006
Bibliographic reference	Dziobek, I., Fleck, S., Kalbe, E., *et al*. (2006) Introducing MASC: a Movie for the Assessment of Social Cognition. *Journal of Autism and Developmental Disorders, 36*, 623-636.
Clinical features and settings	**Recruitment:** Asperger syndrome group from local support groups or referred by specialist clinician Matched control group from volunteers participating in ongoing studies of normal aging and dementia **Country:** USA
Participants	**N=** AS N = 21 (2 were excluded post diagnosis); Controls N = 20 **Age:** AS group: mean = 41.6 years (SD = 10.4, range = 25-62 years) Matched control group: mean = 39.9 (SD = 12.6 years) **Sex:** AS group: 19 = M, 2 = F Matched control group: 18 = M, 2 = F **Ethnicity:** Not stated **Intellectual Ability:** AS group = WAIS IQ Score of 122 (SD = 6.1, range = 111-134) Matched control group = WAIS IQ Score of 124 (SD = 6.3, range = 108-139)
Study design	Cross-sectional
Target condition and reference standard(s)	**Diagnosis:** DSM-IV Asperger syndrome **Coexisting conditions:** None stated
Index and comparator tests	**1.Instrument** Movie for the Assessment of Social Cognition (MASC) **2.Reference Standard** DSM-IV diagnosis; 16/19 also had the ADI-R as parental informants were available (assessed from taped interview) **Assessors** **1.Instrument** Trained tester **2.Reference Standard** One psychiatrist and two psychologists
Follow-up	
Limitations	
Source of funding	Not stated
Notes	• Participants underwent medical, neurologic, psychiatric and neurological examinations to exclude any with conditions that could significantly impact of functional ability • Autism-Spectrum Quotient (AQ), Reading the Mind in the Eyes Test, and a basic emotion recognition task were also administered • An extensive neurological test battery was administered to assess memory, attention and executive functions

Study ID	GARFIN1988
Bibliographic reference	Garfin, D. & McCallon, D. (1988) Validity and reliability of the Childhood Autism Rating Scale with autistic adolescents. *Journal of Autism and Developmental Disorders, 18*, 367-378.
Clinical features and settings	**Recruitment:** Students involved in the district autism programme **Country:** USA
Participants	**N=**Autistic group N=20; Matched controls N=20 **Age:** Autistic group mean age = 16.3 years (range 12-22 years) Matched controls mean age = 15.6 years (range 13-20 years) **Sex:** Not stated **Ethnicity:** 28 Black; 6 white; 6 Hispanic **Intellectual Ability:** Autistic group IQ = 47.7 (SD = 20.9) Matched control group IQ = 47.2 (SD = 23.7)
Study design	Cross sectional
Target condition and reference standard(s)	**Diagnosis:** Autism diagnosed with Adolescent and Adult Psychoeducatioonal Profile **Coexisting conditions:** None stated
Index and comparator tests	**1.Instrument** Childhood Autism Rating Scale (CARS) **2.Reference Standard** Diagnosis using the Adolescent and Adult Psychoeducational Profile (AAPEP) **Assessors** **1.Instrument** Two psychology graduate students **2.Reference Standard** Psychologist and speech clinician
Follow-up	
Limitations	
Source of funding	Not stated
Notes	• Used data for "Study 2" only in the paper. Study 1 was with a population of children

Study ID	GILLBERG2001
Bibliographic reference	Gillberg, C., Gillberg, C., Rastam, M., *et al*. (2001) The Asperger Syndrome (and High Functioning Autism) Diagnostic Interview (ASDI): a preliminary study of a new structured clinical interview. *Autism, 5*, 57-66.
Clinical features and settings	**Recruitment:** Unclear **Country:** Sweden
Participants	**N=** 24 **Age:** 6 – 55 years **Sex:** 18 = M, 6= F. **Ethnicity:** Not stated **Intellectual Ability:** Not stated
Study design	Cross-sectional
Target condition and reference standard(s)	**Diagnosis:** DSM-IV Asperger syndrome **Coexisting conditions:** N = 17 with neuropsychiatric disorder
Index and comparator tests	**1.Instrument** Asperger Syndrome (and High Functioning Autism) Diagnostic Interview (ASDI) **2.Reference Standard** DSM-IV diagnosis **Assessors** **1.Instrument** Two expert neuropsychiatrists (one scoring ASDI and the other observing) **2.Reference Standard** Two neuropsychiatrists or one neuropsychiatrist and one neuropsychologist
Follow-up	
Limitations	
Source of funding	Swedish Medical Research Council (grant no. K2000-21X-11251-06C) State grants under the LUA agreement
Notes	

Study ID	LORD1997
Bibliographic reference	Lord, C., Pickles, A., McLennan, J., *et al*. (1997) Diagnosing autism: analyses of data from the Autism Diagnostic Interview. *Journal of Autism and Developmental Disorders, 27*, 501-517.
Clinical features and settings	**Recruitment:** Data & referrals from eight sites (Institute of Psychiatry, University of London; Greensboro-High Point TEACH Center; John Hopkins University; Glenrose Hospital, Edmonton, Alberta; INSERM research team, France; University of Pittsburgh Clinic for Social Dysfunction; Emory University **Country:** USA, UK, France
Participants	**N=**330 **Age:** Nonverbal participants mean age = 14.5 years (SD = 7.2, range = 3-37 years) Verbal participants mean age = 21.4 years (SD = 6.9, range = 12-40 years) **Sex:** Not stated **Ethnicity:** Not stated **Intellectual Ability:** Nonverbal group IQ = 56 (SD = 17.9; range = 39-84) Verbal group IQ = 94.8 (SD = 14.3, range = 80-144)
Study design	Cross sectional
Target condition and reference standard(s)	**Diagnosis:** DSM-III-R Autism, PDD-NOS **Coexisting conditions:** None stated
Index and comparator tests	**1.Instrument** Autism Diagnostic Interview (ADI) **2.Reference Standard** DSM-III-R diagnostic criteria **Assessors** **1.Instrument Unknown** – scores on the instrument obtained from records **2.Reference Standard** Clinical judgement of principle investigator/ senior research associates
Follow-up	
Limitations	• Scores on the ADI were obtained by unknown raters
Source of funding	National Institute of Mental Health K05 MH01196, MH19726 Grant from the John D. And Catherine T. MacArthur Foundation in association with the DSM-IV Field Trials to the first author
Notes	

Study ID	LORD2000
Bibliographic reference	Lord, C., Risi, S., Lambrecht, L., *et al*. (2000) The Autism Diagnostic Observation Schedule-Generic: a standard measure of social and communication deficits associated with the spectrum of autism. *Journal of Autism and Developmental Disorders, 30*, 205-223.
Clinical features and settings	**Recruitment:** Referrals to the Developmental Disorders Clinic, University of Chicago **Country:** USA & UK
Participants	**N=** 45 (20 participants used in reliability analyses) **Age:** Autism group = 18.65 years (SD = 7.79); PDDNOS group = 21.59 years (SD = 8.56); Nonspectrum group = 19.11 years (SD = 6.27) **Sex:** 37 M, 8 F **Ethnicity:** Not stated **Intellectual Ability:** Verbal IQ:- Autism group = 99.94 (22.29); PDDNOS group = 105.5 (21.46); Nonspectrum group = 99.73 (26.69) Nonverbal IQ:- Autism group = 94.06 (28.22); PDDNOS group = 105.21 (21.82); Nonspectrum group = 103.8 (27.48)
Study design	Cross-sectional
Target condition and reference standard(s)	**Diagnosis:** Autism using Autism Diagnostic Observation Schedule-Generic (ADOS-G) **Coexisting conditions:** None stated
Index and comparator tests	**1.Instrument** Autism Diagnostic Observation Schedule-Generic (ADOS-G) – Module 4 **2.Reference Standard** Clinical Interview (included use of the ADI-R) **Assessors** **1.Instrument** Twelve experienced examiners **2.Reference Standard** Clinical psychologist and clinical psychiatrist
Follow-up	
Limitations	
Source of funding	Not stated
Notes	• Assessment conducted live and via videotape

Study ID	MATSON2007A
Bibliographic reference	Matson, J. L., Boisjoli, J. A., Gonzalez, M. L., *et al*. (2007) Norms and cut off scores for the autism spectrum disorders diagnosis for adults (ASD-DA) with intellectual disability. *Research in Autism Spectrum Disorders, 1*, 330-338.
Clinical features and settings	**Recruitment:** Residents from two developmental centres located in the Southeastern region of the United States **Country:** USA
Participants	**N=** 232 **Age:** 20-80 years **Sex:** Not stated **Ethnicity:** Not stated **Intellectual Ability:** Intellectual disability:- Profound N = 176; Severe N = 33; Moderate N = 12; Mild N = 1; Unspecified N = 10
Study design	Cross sectional
Target condition and reference standard(s)	**Diagnosis:** DSM-IV/ICD-10 ASC **Coexisting conditions:** With/without learning disabilities (profound to mild)
Index and comparator tests	**1.Instrument** Autism Spectrum Disorders Diagnosis for Adults with intellectual disability (ASD-DA) **2.Reference Standard** DSM-IV/ICD-10 diagnosis criteria list of symptoms **Assessors** **1.Instrument** Clinical psychology doctorate students **2.Reference Standard** Clinical psychology doctorate students
Follow-up	
Limitations	
Source of funding	Not stated
Notes	

Study ID	MATSON2007B
Bibliographic reference	Matson, J. L. & Wilkins, J. (2007) Reliability and factor structure of the Autism Spectrum Disorders – Diagnosis Scale for Intellectually Disabled Adults (ASD-DA). *Journal of Developmental and Physical Disabilities, 19*, 565-577.
Clinical features and settings	**Recruitment:** Residents from two developmental centres in central or south Louisiana **Country:** USA
Participants	**N=** 192 **Age:** ASC group mean age = 48.4 years (SD=10.9, range = 20 – 78 years) Control group mean age = 53.9 years (SD=13.5, range = 27 – 88 years) **Sex:** 109 M, 83 F **Ethnicity:** Percent Caucasian:- ASC group = 72%; Control group = 72.9% **Intellectual Ability:** Intellectual disability:- Profound N = 142; Severe N = 28; Moderate N = 13; Mild N = 1 Percent profound intellectual disability:- ASC group = 88.8%; Control group = 52.9%
Study design	Cross sectional
Target condition and reference standard(s)	**Diagnosis:** ASC (Autism or PDD-NOS) **Coexisting conditions:** Learning disabilities
Index and comparator tests	**1.Instrument** Autism Spectrum Disorders – Diagnosis Scale for Intellectually Disabled Adults (ASD-DA) **2.Reference Standard** DSM-IV-TR and ICD-10 diagnostic criteria **Assessors** **1.Instrument** PhD students in Clinical Psychology **2.Reference Standard** PhD students in Clinical Psychology
Follow-up	
Limitations	
Source of funding	Not stated
Notes	

Study ID	MATSON2008
Bibliographic reference	Matson, J. L., Wilkins, J., Boisjoli, J. A., *et al*. (2008) The validity of the autism spectrum disorders-diagnosis for intellectually disabled adults (ASD-DA). *Research in Developmental Disabilities, 29*, 537-546.
Clinical features and settings	**Recruitment:** Residents of developmental centres **Country:** USA
Participants	**N=**307 **Age:** Mean age = 55 years, range = 16-88 years **Sex:** 168M, 139F **Ethnicity:** Percentage of Caucasians ASC Group 78.2%; Control group 76% **Intellectual Ability:** N=235 profound LDs, N=40 severe LDs, N=16 moderate LDs, N=2 mild LDs, N=14 unspecified LDs
Study design	Cross sectional
Target condition and reference standard(s)	**Diagnosis:** DSM-IV-TR or ICD-10 ASC **Coexisting conditions:** Anxiety disorders, depressive disorder, pica, stereotypic movement disorder
Index and comparator tests	**1.Instrument** Autism Spectrum Disorders-diagnosis for intellectually Disabled Adults (ASD-DA) **2.Reference Standard** DSM-IV-TR or ICD-10 clinical diagnosis **Assessors** **1.Instrument** PhD level clinical psychology student **2.Reference Standard** PhD level clinical psychology student
Follow-up	
Limitations	
Source of funding	Not stated
Notes	• Direct care staff were interviewed not adults with ASC

Study ID	RITVO2008
Bibliographic reference	Ritvo, R. A., Ritvo, E. R., Guthrie, D., *et al*. (2008) A scale to assist the diagnosis of autism and asperger's disorder in adults (RAADS): a pilot study. *Journal of Autism and Developmental Disorders, 38*, 213-223.
Clinical features and settings	**Recruitment:** Patients known to clinicians, national autism and Asperger's Disorder support group, referrals from autism diagnostic clinics, volunteers for advertisements on websites for adults with Asperger's Disorder **Country:** USA
Participants	**N=** 94 **Age:** Mean age = 38 years **Sex:** 47 M, 47 F **Ethnicity:** Not stated **Intellectual Ability:** 17% high school education; 83% college education
Study design	Cross sectional
Target condition and reference standard(s)	**Diagnosis:** Aspergers syndrome or autistic disorder **Coexisting conditions:** None stated
Index and comparator tests	**1.Instrument** Ritvo Autism and Asperger's Diagnostic Scale (RAADS) **2.Reference Standard** DSM-IV-TR clinical diagnosis **Assessors** **1.Instrument** Self-completed **2.Reference Standard** Two psychiatrists
Follow-up	
Limitations	• Clinicians not blind to participants prior diagnosis
Source of funding	Not stated
Notes	

Study ID	RITVO2011
Bibliographic reference	Ritvo, R. A., Ritvo, E. R., Gutherie, D., *et al*. (2011) The Ritvo Autism Asperger Diagnostic Scale-Revised (RAADS-R): a scale to assist the diagnosis of autism spectrum disorder in adults: an international validation study. *Journal of Autism and Developmental Disorders, 41*, 1076-1089.
Clinical features and settings	**Recruitment:** From nine English speaking centres on three continents **Country:** English speaking countries
Participants	**N=** 779 **Age:** Mean age 30.81 – 42.04 across diagnostic groups **Sex:** 394 M, 386 F **Ethnicity:** Not stated **Intellectual Ability:** IQ of 80 and above
Study design	Cross sectional
Target condition and reference standard(s)	**Diagnosis:** DSM-IV-TR ASC (Asperger's syndrome or autistic disorder) **Coexisting conditions:** None stated
Index and comparator tests	**1.Instrument** Ritvo Autism Asperger Diagnostic Scale-Revised (RAADS-R) **2.Reference Standard** DSM-IV-TR Clinical diagnosis **Assessors** **1.Instrument** Self-completed **2.Reference Standard** Psychiatrist or licensed psychologist
Follow-up	
Limitations	
Source of funding	Not stated
Notes	

1.2.2 Characteristics of excluded studies

BOLTE2008

Reason for exclusion	Validated in children

BUITELAAR1999

Reason for exclusion	8.7% of the sample were adults

CAPONE2005

Reason for exclusion	Validated in children

HELLINGS2005

Reason for exclusion	Validated in children

LECAVALIER2006

Reason for exclusion	Validated in children

LECONTEUR1989

Reason for exclusion	Validated in children

PROSSER1998

Reason for exclusion	16% of the sample diagnosed with Autism which is too low

READING2007

Reason for exclusion	Validated in children

ROJAHN2001

Reason for exclusion	4.4% with ASC which is too low

STURMEY1995

Reason for exclusion	Psychometric data not provided

1.2.3 References of excluded studies

BOLTE2008
Bolte, S., Poustka, F. & Constantino, J. N. (2008) Assessing autistic traits: cross-cultural validation of the social responsiveness scale (SRS). *Autism Research, 1*, 354-363.

BUITELAAR1999
Buitelaar, J. K., Van der Gaag, R., Klin, A., *et al*. (1999) Exploring the boundaries of pervasive developmental disorder not otherwise specified: analyses of data from the DSM-IV autistic disorder field trial. *Journal of Autism and Devlopmental Disorders, 29*, 33-43.

CAPONE2005
Capone, G. T., Grados, M. A., Kaufmann, W. E., *et al*. (2005) Down syndrome and comorbid autism-spectrum disorder: characterization using the aberrant behavior checklist. *American Journal of Medical Genetics, 134A*, 373-380.

HELLINGS2005
Hellings, J. A., Nickel, E. J., Weckbaugh, M., *et al*. (2005) The overt aggression scale for rating aggression in outpatient youth with autistic disorder: preliminary findings. *Journal of Neuropsychiatry and Clinical Neurosciences, 17*, 29-35.

LECAVALIER2006
Lecavalier, L. & Aman, M. G. (2006) Validity of the autism diagnostic interview-revised. *American Journal of Mental Retardation, 111*, 199-215.

LECONTEUR1989
Le Couteur, A. & Rutter, M. (1989) Autism diagnostic interview: a standardized investigator-based instrument. *Journal of Autism and Devlopmental Disorders, 19*, 363-387.

PROSSER1998
Prosser, H., Moss, S., Costello, H., *et al*. (1998) Reliability and validity of the mini PAS-ADD for assessing psychiatric disorders in adults with intellectual disability. *Journal of Intellectual Disability Research, 42*, 264-272.

READING2007
Reading, S. & Richie, C. (2007) Documenting changes in communication behaviours using a structured observation system. *Child Language Teaching and Therapy, 23*, 181-200.

ROJAHN2001
Rojahn, J., Matson, J. L., Lott, D., *et al*. (2001) The behaviour problems inventory: an instrument for the assessment of self-injury, stereotyped behaviour, and aggression/destruction in individuals with developmental disabilities. *Journal of Autism and Developmental Disorders, 31*, 577-588.

STURMEY1995
Sturmey, P., Burcham, K. J. & Perkins, T. S. (1995) The reiss screen for maladaptive behaviour: its reliability and internal consistencies. *Journal of Intellectual Disability Research, 39*, 191-195.

1.3 PSYCHOSOCIAL INTERVENTIONS

1.3.1 Characteristics of included studies

Study ID	BATHAEE2001
Bibliographic reference	Bat-haee, M.A. (2001) A longitudinal study of active treatment of adaptive skills of individuals with profound mental retardation. *Psychological Reports, 89*, 345-354.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Non-blind **Setting:** Residential **Raters:** Psychologists **Country:** USA
Participants	**Diagnosis:** LD (DSM-IV) **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Slosson Intelligence Test **N:** 59 for first 5 year comparison, 51 for next 5 year comparison **Age:** 32-75 years (mean: 44.4 years) **Sex:** For first 5 year comparison: Male: 14; Female: 45; for second five year comparison: Male:12; Female: 39 **Ethnicity:** Not reported **IQ:** Mental age = 2-17 months **Inclusion criteria:** LD adults living in group homes
Interventions	1. Active treatment (N=59 or N=51) **Duration:** **Intervention:** 10 years **Follow-up:** 10 years
Outcomes	Data on participants' adaptive skills were taken from their records and were done using the Behaviour Maturity Checklist II-1978 which examines six general areas of adaptive skills (dressing, grooming, eating, toileting, language, and social interaction). Data were extracted for the toileting subscale.
Study Design	Observational (before-and-after study)
Source of funding	Not reported
Limitations	1. No control group 2. Little detail given about nature of intervention 3. Efficacy data cannot be extracted
Notes	• This is longitudinal 10-year study examining changes in a number of adaptive skills over consecutive 5-year periods. Data is extracted for toileting over both periods as this adaptive skill continues to improve.

Study ID	BENSON1986
Bibliographic references	Benson, B.A., Rice, C.J. & Miranti, S.V. (1986) Effects of anger management training with mentally retarded adults in group treatment. *Journal of Consulting and Clinical Psychology, 54*, 728-729.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Non-blind **Setting:** Community **Raters:** Self-report, 2 students were trained to rate role-play responses, and two supervisors from subject's vocational training centre **Country:** USA
Participants	**Diagnosis:** LD **Coexisting conditions:** Not given **Qualifying Diagnostic Assessment:** Level of intellectual functioning taken from training centre records and based on the American Association on Mental Deficiency system **N:** 54 **Age:** 17-57 years (mean: 32 years) **Sex:** Male: 37; Female: 17 **Ethnicity:** Black N=28, white N=23, Hispanic N=3 **IQ:** Not reported, mildly or moderately mentally retarded **Inclusion criteria:** Participants were from vocational training centres for the developmentally disabled and acknowledged that losing their temper at work was a problem
Interventions	1. CBT anger management training, including a relaxation group, self-instruction group, problem solving condition, and a combined condition beginning with relaxation training, followed by self-instruction, and then by problem solving (N=54) **Duration:** **Intervention:** 12 weekly 90-minute sessions **Follow-up:** 19 weeks
Outcomes	The primary outcome was anger management. Outcome measures were a self-report Anger Inventory (AI), a Conflict Situations Test (CST) which provides mean aggression scores for Think and Do responses separately, ratings of videotaped role-plays of anger-arousing situations, and supervisor ratings on an aggressive behaviour rating scale. Data were extracted for aggressive gestures on the videotaped roleplay test.
Study Design	Observational (before-and-after)
Source of funding	Not reported
Limitations	1. No control group 2. Sample sizes in the different CBT groups do not allow for comparison 3. Efficacy data could not be extracted
Notes	-Data extracted for the gestures dimension of the videotaped roleplay test. Results suggestive of significant pre-to-post-test difference but difference not maintained at follow-up 4-5 weeks later

Study ID	BOTSFORD2004
Bibliographic reference	Botsford, A.L. & Rule, D. (2004) Evaluation of a group intervention to assist aging parents with permanency planning for an adult offspring with special needs. *Social Work, 49*, 423-431.
Methods	**Allocation:** Randomised **Matching:** Matched on age and marital status **Blindness:** Non-blind **Setting:** Not reported **Raters:** Graduate student **Country:** USA
Participants	**Diagnosis:** ASC **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 27 **Age:** Mothers: 49-82 years (mean: 64.2); Children: 23-49 years (mean: 33.7) **Sex:** Male: 0; Female: 27 **Ethnicity:** White N=26 **IQ:** Not reported **Inclusion criteria:** To participate in the study mothers had to have a son or daughter who was at least 23 years old, their offspring were identified as having intellectual disability, the offspring lived with the mother, and the mother had not made appreciable permanency plans for the offspring.
Interventions	1. Psychoeducational permanency planning group intervention (N=13) which provided opportunities for parents to express concerns about future of their offspring, increase participants' awareness and knowledge about options and resources, identify obstacles to planning, strengthen relationships with professionals, and problem solve on specific planning issues and concerns. Group sessions included both parent discussion and interaction, and speakers on residential, financial and legal resources followed by group discussion. 2. Control group (N=14) **Duration:** **Intervention:** 6 weeks **Follow-up:** 6 weeks
Outcomes	Primary outcome was mothers' awareness and knowledge of planning issues including knowledge and awareness about planning, competence and confidence to plan, appraisals of the planning process, intermediate planning behaviours, and residential and legal planning. Interviews with mothers were coded using standardized (including Heller & Factor's [1991] Community Resources Scale) and original scales and variables were clustered into the five categories listed previously.
Study Design	RCT
Source of funding	Not reported
Limitations	1. Non-blind allocation, administration and assessment 2. Randomization methods uinclear 3. Small sample size 4. Group N not clear, assumed N=13 in experimental and N=14 in control but not clear that this assumption is correct

	5. Not clear that control group received care apart from intervention 6. Indirect as extrapolating from adults with intellectual disability 7. Relatively short duration of follow-up
Notes	• One mother terminated participation because of her daughter's medical crisis

Study ID	ELLIOTT1991
Bibliographic reference	Elliott, R.O. Jr., Hall, K.L. & Soper, H.V. (1991) Analog language teaching versus natural language teaching: generalization and retention of language learning for adults with autism and mental retardation. *Journal of Autism and Developmental Disorders, 21*, 433-447.
Methods	**Allocation:** Non-randomised **Matching:** Matched according to vocabulary scores. Groups did not significantly differ in mental age equivalents, chronological ages, and total duration of stays in residential treatment facilities **Blindness:** Blind observers for 40/120 assessments to score rater reliability **Setting:** Residential **Raters:** Trained evaluators **Country:** USA
Participants	**Diagnosis:** ASC **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** DSM-III-R **N:** 23 **Age:** 17-37 years (mean: 26 years) **Sex:** Male: 19; Female: 4 **Ethnicity:** Not reported **IQ:** Not reported - severe to profound cognitive delays, average estimated mental age equivalent = 3.3 years (range 1.7-5.1) **Inclusion criteria:** Clients of residential treatment program with ASC and severe to profound cognitive delays. All participants were in good health. None had significant sensory or motor disabilities or displayed behaviours likely to preclude regular attendance at scheduled training sessions
Interventions	1. Analog language teaching which attempts to evoke imitative responses through use of successive trials (N=23, but halved for data analysis as this is a crossover study) 2. Natural language teaching which allows participant to select items which determine order of presentation (N=23, but halved for data analysis as this is a crossover study) **Duration:** **Intervention:** 1 month for each intervention **Follow-up:** 3 months
Outcomes	Number of nouns generalized
Study Design	Quasi-experimental (crossover)
Source of funding	Not reported
Limitations	1. Small sample size 2. No waiting-list or attention-placebo control group 3. Study designed to compare two ABA techniques and not to examine the overall efficacy of ABA training for language acquisition
Notes	

Study ID	ERGUNERTEKINALP2004
Bibliographic reference	Ergüner-Tekinalp, B. & Akkök, F. (2004) The effects of a coping skills training program on the coping skills, hopelessness, and stress levels of mothers of children with autism. *International Journal for the Advancement of Counselling, 26*, 257-269.
Methods	**Allocation:** Non-randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Education **Raters:** Self-completed questionnaires **Country:** Turkey
Participants	**Diagnosis:** ASC **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 20 **Age:** Mothers: 29-52 years (means: experimental group: 42.4; control group: 39.1); Children: 11-19 years (means: experimental group: 15.2 years; control group: 14) **Sex:** Male: 0; Female: 20 **Ethnicity:** Not reported **IQ:** Not reported **Inclusion criteria:** Not reported
Interventions	1. Coping skills training programme (N=10) consisting of eight group sessions which used techniques of instruction, discussion, sharing and application of techniques and covered understanding stress and coping, general coping strategies, problem solving, relaxation training, positive thinking, and social support. 2. Control group (N=10). After completion of experimental training program the control group were provided with written information about skills and techniques used in the program. **Duration:** **Intervention:** 4 weeks (twice-weekly 1.5 hour sessions) **Follow-up:** 4 weeks
Outcomes	Primary outcomes were parental stress as measured by The Questionnaire on Resources and Stress (QRS; Holroyd, 1987); parental coping skills as measured by The Coping Skills Strategy Indicator (CSI; Amirkhan, 1990); and parental depression (as measured by the Beck Hopelessness Scale (BHS; Beck et al., 1974)
Study Design	Quasi-experimental (parallel groups)
Source of funding	Not reported
Limitations	1. Group allocation not randomised 2. Efficacy data cannot be extracted 3. Small sample size 4. Short duration of follow-up
Notes	

Study ID	FELDMAN1999
Bibliographic reference	Feldman, M.A., Ducharme, J.M. & Case, L. (1999) Using self-instructional pictorial manuals to teach child-care skills to mothers with intellectual disabilities. *Behavior Modification, 23*, 480-497.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Non-blind **Setting:** Community **Raters:** Not reported **Country:** Canada
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** WAIS-R **N:** 10 **Age:** 19-39 years (mean: 28 years) **Sex:** Male: 0; Female: 10 **Ethnicity:** Not reported **IQ:** 71-76 (mean: 73.8) **Inclusion criteria:** Not reported
Interventions	1. Self-instructional pictorial manuals to teach child-care skills (N=10) **Duration:** **Intervention:** Until mothers reached training criterion of 80% or higher for 2 sessions **Follow-up:** 3 years
Outcomes	Target child-care behaviour checklist
Study Design	Observational (before-and-after)
Source of funding	Ontario Mental Health Foundation and the Ontario Ministry of Community and Social Services Research Grants Program
Limitations	1. Small sample size 2. No control group 3. Duration of intervention not reported 4. Efficacy data cannot be extracted
Notes	

Study ID	GARCIAVILLAMISAR2000
Bibliographic reference	García-Villamisar, D., Ross, D. & Wehman, P. (2000) Clinical differential analysis of persons with autism in a work setting: a follow-up study. *Journal of Vocational Rehabilitation, 14*, 183-185.
Methods	**Allocation:** Non-randomised **Matching:** Matched on age, total score on Childhood Autism Rating Scale (CARS), and degree of intelligence **Blindness:** Non-blind **Setting:** Community for supported work group **Raters:** First author conducted interviews with caretakers, therapists, and families **Country:** Spain & Germany
Participants	**Diagnosis:** DSM IV ASC **Coexisting conditions:** N=22 epilepsy **Qualifying Diagnostic Assessment:** Not reported **N:** 51 **Age:** Range not reported (means: sheltered workshop group mean: 21.07 years; supported work group mean: 21.64 years) **Sex:** Male: 39; Female: 12 **Ethnicity:** Not reported **IQ:** Range not reported (means: sheltered workshop group mean: 55.52; supported work group mean: 57.41; as assessed with the IQ Leiter) **Inclusion criteria:** Supported employment subjects selected on the following criteria: sheltered workshops enrolment prior to participation in supported work program; diagnosis of autism; no severe behaviour problems; acceptable professional and vocational abilities; informed consent
Interventions	1. Sheltered workshop group (N=25) 2. Supported work group (all jobs in the community, predominantly in service sector and included food services, waiters, recycling and delivery, retail, gardening, industrial laundry, agriculture and cattle-raising; all subjects worked 15-30 hours per week; job coach assigned to each worker) (N=26) **Duration:** **Intervention:** Average length of community employment was 30 months **Follow-up:** 3 years (1996-1999)
Outcomes	Primary outcome was autistic behaviours as measured by the Childhood Autism Rating Scale (CARS)
Study Design	Quasi-experimental (parallel groups)
Source of funding	Not reported
Limitations	1. Figures in text and tables do not add up with regards to sample size of the group. The sample sizes reported in the demographic table are extracted as these are corroborated by follow-up study. 2. No inclusion criteria reported for sheltered workshop group
Notes	

Study ID	GARCIAVILLAMISAR2002
Bibliographic reference	García-Villamisar, D., Wehman, P. & Diaz Navarro, M. (2002) Changes in the quality of autistic people's life that work in supported and sheltered employment. a 5-year follow-up study. *Journal of Vocational Rehabilitation, 17*, 309-312.
Methods	**Allocation:** Non-randomised **Matching:** Matched on age, total score on Childhood Autism Rating Scale (CARS), and degree of intelligence **Blindness:** Non-blind **Setting:** Community for supported work group **Raters:** First author conducted interviews with caretakers, therapists, and families **Country:** Spain & Germany
Participants	**Diagnosis:** DSM IV ASC **Coexisting conditions:** N=22 epilepsy **Qualifying Diagnostic Assessment:** Not reported **N:** 51 **Age:** Range not reported (means: sheltered workshop group mean: 21.07 years; supported work group mean: 21.64 years) **Sex:** Male: 39; Female: 12 **Ethnicity:** Not reported **IQ:** Range not reported (means: sheltered workshop group mean: 55.52; supported work group mean: 57.41; as assessed with the IQ Leiter) **Inclusion criteria:** Supported employment subjects selected on the following criteria: sheltered workshops enrolment prior to participation in supported work program; diagnosis of autism; no severe behaviour problems; acceptable professional and vocational abilities; informed consent
Interventions	1. Sheltered workshop group (N=25) 2. Supported work group (all jobs in the community, predominantly in service sector and included food services, waiters, recycling and delivery, retail, gardening, industrial laundry, agriculture and cattle-raising; all subjects worked 15-30 hours per week; job coach assigned to each worker) (N=26) **Duration:** **Intervention:** Average length of community employment was 30 months **Follow-up:** 3 years (1996-1999)
Outcomes	Primary outcome was quality of life as measured by the Quality of Life Survey (QLS; Sinnot-Oswald et al., 1991)
Study Design	Quasi-experimental (parallel groups)
Source of funding	Horizon Program of European Union and Cosejer ía de Asuntos Sociales de la Comunidad Autónoma de Madrid (Spain)
Limitations	1. Figures in text and tables do not add up with regards to sample size of the group. The sample sizes reported in the demographic table are extracted
Notes	• Follow-up from GARCIAVILLAMISAR2000 but different outcome data reported and extracted

Study ID	GARCIAVILLAMISAR2007
Bibliographic reference	García-Villamisar, D. & Hughes, C. (2007) Supported employment improves cognitive performance in adults with autism. *Journal of Intellectual Disability Research, 51*, 142-150.
Methods	**Allocation:** Random selection but not allocation **Matching:** No matching **Blindness:** Non-blind **Setting:** Supported work was in the community **Raters:** Computer-administered testing **Country:** Spain
Participants	**Diagnosis:** DSM-IV ASC **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Childhood Autism Rating Scale (CARS) >30 **N:** 44 **Age:** Range not reported (means: supported work group mean: 25.52 years; no supported work group mean: 24.32 years) **Sex:** Male: 32; Female: 12 **Ethnicity:** Not reported **IQ:** Range not reported (means: supported work group mean: 80.81; no supported work mean: 82.42; as assessed by the British Picture Vocabulary Scale) **Inclusion criteria:** Supported employment participants selected according to the following criteria: sheltered workshops enrolment prior to the participation in the supported work program (minimum 2 years); no previous participation in other supported employment programs; diagnosis of autism; no severe behavioural problems; acceptable professional and vocational abilities; informed consent; and all participants required to score above the 35th percentile point on the Standard Progressive Matrices (SPM)
Interventions	1. Supported work group (all jobs were in the community and predominantly in the service sector including food services, waiters, recycling and delivery, retail, gardening, industrial laundry, agriculture and cattle raising; participants worked an average of 20 hours per week; job coach assigned to each worker) (N=22?) 2. Waiting list control group (N=22?) **Duration:** **Intervention:** Mean length of supported employment was 30 months **Follow-up:** Mean length of supported employment was 30 months
Outcomes	Primary outcome was executive functioning and memory performance as assessed by a battery of neuropsychological tests from the Cambridge Neuropsychological Tests: Automated Battery (CANTAB). Data for a measure of executive functioning, the 'Stockings of Cambridge' (SOC) Planning task was selected for analysis. This task is a computerized version of the Tower of London Planning Task.
Study Design	Quasi-experimental (parallel groups)
Source of funding	Fondo Social Europeo and Consejería de Asuntos Sociales de la Comunidad Autónoma de Madrid
Limitations	1. Sample sizes for each group not reported. Data was extracted on the basis of an equal sample size in each group but obviously this

	assumption may be invalid 2. No inclusion criteria reported for the waiting list controls
Notes	• Data for Planning task 'Stockings of Cambridge', average planning time extracted

Study ID	GARCIAVILLAMISAR2010
Bibliographic reference	García-Villamsiar, D.A. & Dattilo, J. (2010) Effects of a leisure programme on quality of life and stress of individuals with ASD. *Journal of Intellectual Disability Research, 54*, 611-619.
Methods	**Allocation:** Randomised **Matching:** No matching **Blindness:** Blind outcome assessment **Setting:** Residential and community **Raters:** Team of therapists blind to objectives of research **Country:** Spain
Participants	**Diagnosis:** ASC (N=2 Asperger syndrome) **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Clinically diagnosed by a psychiatrist or clinical psychologist with several years of experience in assessment of ASC and related conditions **N:** 71 **Age:** 17-39 years (means: experimental mean: 31.49 years; control mean: 30.06 years) **Sex:** Male: 41; Female: 30 **Ethnicity:** Not reported **IQ:** Not reported **Inclusion/exclusion criteria:** All participants were screened to exclude comorbid psychiatric illness (e.g. schizophrenia, major depression) and neurological disorders that might influence brain function (e.g. epilepsy)
Interventions	1. Leisure program (N=37), consisted of a group recreation context from 17:00-19:00 (2 hours) each day (5 days/week) for participants to interact with media, engage in exercise, play games and do crafts, attend events and participate in other recreation activities. The criteria for activity selection included those activities that were understandable, reactive, comfortable, and active 2. Waiting list control group (N=34) **Duration:** **Intervention:** One year **Follow-up:** One year
Outcomes	The primary outcome was quality of life as measured by the Quality of Life Questionnaire-Spanish version (QOL) (Scaholck & Keith, 1993; Caballo et al., 2005)
Study Design	RCT
Source of funding	Not reported
Limitations	1. No attention-placebo condition
Notes	

Study ID	GARCIAVILLAMISAR2011
Bibliographic reference	García-Villamisar, D. & Dattilo, J. (2011) Social and clinical effects of a leisure program on adults with autism spectrum disorder. *Research in Autism Spectrum Disorders, 5*, 246-253.
Methods	**Allocation:** Randomised **Matching:** Participants were matched according to age and gender **Blindness:** Blind outcome assessment **Setting:** Residential **Raters:** Team of therapists blind to objectives of research **Country:** Spain
Participants	**Diagnosis:** ASC **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Clinically diagnosed by a psychiatrist or clinical psychologist with several years of experience in assessment of ASC and related conditions **N:** 40 **Age:** 24-38 years (means: experimental group mean: 32.05 years; control group mean: 31.75 years) **Sex:** Male: 24; Female: 16 **Ethnicity:** Not reported **IQ:** Not reported **Inclusion criteria:** All participants were screened to exclude comorbid psychiatric illness (e.g. schizophrenia, major depression) and neurological disorders that might influence brain function (e.g. epilepsy)
Interventions	1. Leisure program (N=20), consisted of a group recreation context from 17:00-19:00 (2 hours) each day (5 days/week) for participants to interact with media, engage in exercise, play games and do crafts, attend events and participate in other recreation activities. The criteria for activity selection included those activities that were understandable, reactive, comfortable, and active 2. Waiting list control group (N=20) **Duration:** **Intervention:** One year **Follow-up:** One year
Outcomes	The primary outcome of interest was recognition of emotion as assessed by The Facial Discrimination Battery (FDB)-Spanish version (GarcÍa-Villamisar et al., 2010)
Study Design	RCT
Source of funding	Grant from the Real Patronato para la Discapacidad, Ministerior de Sanidad y Cosumo, Government of Spain; and Asociación Nuevo Horizonte, Madrid, Spain
Limitations	1. No attention-placebo control group
Notes	

Study ID	GOLAN2006
Bibliographic reference	Golan, O. & Baron-Cohen, S. (2006) Systemizing empathy: teaching adults with Asperger syndrome or high-functioning autism to recognize complex emotions using interactive multimedia. *Development and Psychopathology, 18*, 591-617.
Methods	**Allocation:** Randomised **Matching:** Matched on age, verbal and performance IQ, handedness, and gender **Blindness:** Assistants and participants blind to group, but not investigator **Setting:** Community **Raters:** Computer-based assessments which the first author and 3 trained assistants helped participants through **Country:** UK
Participants	**Diagnosis:** ASC (Asperger syndrome and high-functioning autism) **Coexisting conditions:** 5 participants in each group had another psychiatric diagnosis, such as depression or ADHD **Qualifying Diagnostic Assessment:** Autism Spectrum Quotient (AQ) **N:** 41 (data was also reported for a typical control group N=28 but that data is not extracted here) **Age:** 17-52 years (means: experimental group mean: 30.5 years; control group mean: 30.9 years) **Sex:** Male: 31; Female: 10 **Ethnicity:** Not reported **IQ:** 80-140 (means: experimental group mean VIQ: 108.3 and mean PIQ: 112; control group mean VIQ: 109.7 and mean PIQ: 115.3) **Inclusion criteria:** Participants had not participated in any related intervention during the least 3 months and had no plans for engaging in another intervention while the study was ongoing. Participants were also required to complete a minimum of 10 hours intervention training.
Interventions	1. Software home users group (N=19), training with Mind Reading which is an interactive guide to emotions and mental states 2. Control group (N=22), completed pre- and post-assessments but with no intervention **Duration:** **Intervention:** 2 hours per week over a period of 10 weeks (and a minimum of 10 hours) **Follow-up:** 15 weeks
Outcomes	Primary outcome was emotion recognition as assessed by the recognition of complex emotions in faces and voices measured using The Cambridge Mindreading (CAM) Face-Voice Battery, the Reading of the Mind in the Eyes task (revised, adult version), and Reading the Mind in Film task which tests for holistic distant generalization. Data was extracted for the CAM face task
Study Design	RCT
Source of funding	National Alliance for Autism Research, the Corob Charitable Trust, the Cambridge Overseas Trust, B'nai and B'rith Leo Baeck scholarships, Shirley Foundation, MRC, and the Three Guineas Trust
Limitations	1. Generalization to real-life social situations needs to be examined
Notes	-The randomised trial comparing adults with ASC in experimental

	and no-treatment control groups (experiment 1) was followed by a non-randomised trial which compared adults with ASC in the experimental group to an alternative-treatment control group (experiment 2). However, data was not extracted for experiment 2.

Study ID	HARRIS1984
Bibliographic reference	Harris, M.B. & Bloom, S.R. (1984) A pilot investigation of a behavioral weight control program with mentally retarded adolescents and adults: effects on weight, fitness, and knowledge of nutritional and behavioral principles. *Rehabilitation Psychology, 29*, 177-182.
Methods	**Allocation:** Non-randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Community **Raters:** Not reported **Country:** USA
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 21 **Age:** Range not reported (mean: 25.3 years) **Sex:** Male: 4; Female: 17 **Ethnicity:** Not reported **IQ:** Range not reported (mean=52.5) **Inclusion criteria:** Not reported
Interventions	1. Behavioural weight control program (N=10) 2. Dropouts from the program after attending 0-4 meetings (N=11) **Duration:** **Intervention:** 7 weekly meetings **Follow-up:** 26 weeks
Outcomes	Primary outcome was weight loss
Study Design	Quasi-experimental (parallel groups)
Source of funding	Not reported
Limitations	1. Potential bias in group allocation 2. Small sample sizes
Notes	

Study ID	HERBRECHT2009
Bibliographic reference	Herbrecht, E., Poustka, F., Birnkammer, S., *et al*. (2009) Pilot evaluation of the frankfurt social skills training for children and adolescents with autism spectrum disorder. *European Child and Adolescent Psychiatry, 18*, 327-335.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Non-blind **Setting:** Community **Raters:** Non-blind experts; blind experts; parent ratings (teachers also rated but missing data). **Country:** Germany
Participants	**Diagnosis:** ICD-10 ASC **Coexisting conditions:** 3 participants were medicated for obsessive compulsive symptoms, 2 for impulsive and aggressive behaviour, and 1 for hyperactivity. **Qualifying Diagnostic Assessment:** ADOS and ADI-R **N:** 17 **Age:** 9-20 years (mean: 14.7 years) **Sex:** Male: 15; Female: 2 **Ethnicity:** Not reported **IQ:** Range not reported (mean: 93.4) **Inclusion criteria:** Referred outpatients of department of child & adolescent psychiatry; clinical diagnosis of ASD; no functional language and severe co morbid organic health problems (e.g. Fragile X, tuberous sclerosis, intractable epilepsy); IQ>70.
Interventions	1.Frankfurt social skills training (KONTAKT) N=17, social skills groups focused on learning to initiate social overtures, conversation skills, understanding social rules and relationships, identification and interpretation of verbal and non-verbal social signals, problem-solving, coping strategies and improvement of self-confidence. Techniques include teaching of rules, social interaction games, role play, and group discussion. **Duration:** **Intervention:** Weekly 1 hour social skills training sessions for children and 1.5 hour bi-weekly sessions for adolescents for period of 5 months. **Follow-up:** 11 months
Outcomes	Primary outcome was social interaction as measured using a battery of assessments as follows: expert ratings on the Diagnostic Checklist for Pervasive Developmental Disorders (DCL), the Checklist for Group Behaviours (CGB), and the Global Assessment of Functioning Scale (GAS); a blind-expert video rating; parent ratings collected with a modified version of the Parent Interview for Autism (PIA-CV-mini), Social Competence Scale (SKS), and the Family Burden Questionnaire (FaBel). Data were extracted for the blind-expert video rating as this was the only blinded outcome assessment.
Study Design	Observational (before-and-after)
Source of funding	Not reported
Limitations	1. Small sample 2. No control group

	3. Efficacy data could not be extracted
Notes	

Study ID	HILLIER2007
Bibliographic reference	Hillier, A., Fish, T., Cloppert, P., *et al*. (2007) Outcomes of a social and vocational skills support group for adolescents and young adults on the autism spectrum. *Focus on Autism and Other Developmental Disabilities, 22*, 107-115.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Non-blind **Setting:** Community **Raters:** Self-report and 2 trained observers **Country:** USA
Participants	**Diagnosis:** ASC **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Gilliam Asperger's Disorder Scale **N:** 13 **Age:** 18-23 years (mean: 19 years) **Sex:** Male: 11; Female: 2 **Ethnicity:** Not reported **IQ:** 2 participants did not complete due to low verbal skills, for N=11 IQ was 81-141 (mean: 108.08) **Inclusion criteria:** Prior diagnosis of ASC, aged between 18 and 30 years, and commitment to attend sessions
Interventions	1.Aspirations social skills group (N=13), overall aims of the program were to foster understanding of a range of social and vocational issues, to enhance insight and awareness, and to provide social opportunities for group members. **Duration:** **Intervention:** Weekly 1 hour meetings for 8 weeks **Follow-up:** 8 weeks (after completing the program group members attended monthly reunions but no data for these)
Outcomes	Primary outcome was social skills as assessed by self-report measures as follows: modified version of The Index of Peer Relations (IPR) which questions how participants view and evaluate persons in their peer group and whether they are accepted and liked by their peer group; The Autism Quotient (AQ); The Empathy Quotient (EQ); and structured observations by trained observers to determine whether frequency of participants' contributions to the group increased. Data extracted for the EQ.
Study Design	Observational (before-and-after)
Source of funding	Not reported
Limitations	1. Small sample size 2. No control group 3. No data from monthly reunion meetings
Notes	

Study ID	HOWLIN1999
Bibliographic reference	Howlin, P. & Yates, P. (1999) The potential effectiveness of social skills groups for adults with autism. *Autism, 3*, 299-307.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Non-blind **Setting:** Community **Raters:** Family and participants themselves (checklist); unknown raters (video of conversation). **Country:** UK
Participants	**Diagnosis:** ASC **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 10 **Age:** 19-44 years (mean: 28.4 years) **Sex:** Male: 10; Female: 0 **Ethnicity:** Not reported **IQ:** Non-verbal IQ 86-138 (mean: 109) **Inclusion criteria:** Diagnosis of autism or Asperger syndrome; previously attended Maudsley Hospital for diagnosis or treatment; attended an initial 2-day course on social problems and skills; registered interest in attending a social skills group on a regular basis
Interventions	1.Social skills group (N=10) focused on major issues raised by group members and core features of conversational ability. Techniques included role-play, team activities, structured games, and feedback based on behavioural observations **Duration:** **Intervention:** Monthly 2.5 hour sessions over the course of a year **Follow-up:** One year
Outcomes	Primary outcome was social interaction as measured by: checklist of social skills problem areas sent to families and participants themselves; changes in personal life/living situation of participants over the course of the year of intervention; and changes in conversational ability assessed through before and after ratings of video recording of simulated social activities: a party scenario and a job enquiry scenario. Data extracted for the changes in conversational style during the 'party' scenario.
Study Design	Observational (before-and-after)
Source of funding	Not reported
Limitations	1. No control group 2. Small sample size 3. Question of generalization of improvements to naturalistic settings 4. Assessment methods for improvements in social functioning lack any formal assessment of reliability or validity
Notes	

Study ID	HOWLIN2005
Bibliographic reference	Howlin, P., Alcock, J. & Burkin, C. (2005) An 8 year follow-up of a specialist supported employment service for high-ability adults with autism or Asperger syndrome. *Autism, 9*, 533-549.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Not applicable - no control group **Setting:** Not reported **Raters:** Not applicable - objective measure of number of job placements **Country:** UK
Participants	**Diagnosis:** ASC (diagnosis made by either a psychiatrist or psychologist) **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Approximately 20% had diagnosis confirmed by ADI **N:** 89 **Age:** 18-56 years (mean: 31.4 years) **Sex:** Male: 72; Female: 17 **Ethnicity:** Not reported **IQ:** 60-139 (mean: 110.7) as measured by Raven non-verbal IQ **Inclusion criteria:** Clients registered with the scheme between 2002 and 2003 who completed assessments used in original study
Interventions	1. Supported employment group (N=89) **Duration:** **Intervention:** One year **Follow-up:** One year
Outcomes	Primary outcome was job placements
Study Design	Observational (before-and-after study)
Source of funding	Not reported
Limitations	1. No control group 2. Efficacy data cannot be extracted
Notes	• Narrative 7-8 year follow-up data reported for MAWHOOD1999 but this is not extracted here. See notes section of MAWHOOD1999.

Study ID	KHEMKA2000
Bibliographic reference	Khemka, I. (2000) Increasing independent decision-making skills of women with mental retardation in simulated interpersonal situations of abuse. *American Journal on Mental Retardation, 105*, 387-401.
Methods	**Allocation:** Randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Community **Raters:** Not reported **Country:** USA
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 45 **Age:** Range not reported (mean: 35.8 years) **Sex:** Male: 0; Female: 45 **Ethnicity:** Not reported **IQ:** Range not reported (mean: 60.89) **Inclusion criteria:** Participants were women with mild and moderate mental retardation from a large non-profit agency for adults with developmental disabilities and mental retardation. Participant IQ, as provided by agency records, was used as a screening criterion in order to select participants who had adequate communication and language skills required for the decision-making tasks
Interventions	1. Self-directed decision-making training (N=12) which combined instruction on cognitive and motivational aspects of decision-making 2. Control (N=12) Study also reports data for a decision-making training condition (N=12), however, that data is not extracted **Duration:** **Intervention:** 10 training sessions spread over several weeks **Follow-up:** 10 training sessions
Outcomes	Decision-making in response to hypothetical situations of abuse was evaluated using a Social Interpersonal Decision-Making Video Scale where participants watched video vignettes and were assessed on their ability to recommend a decision for the key decision maker. The Self Social Interpersonal Decision Making Scale was also used where participants were presented with vignettes representing situations of interpersonal conflicts and sexual, physical or verbal abuse and asked what they would do in that situation. Finally, the Nowicki-Strickland Internal-External Scale was used to assess participants' perception of their locus of control. Data were extracted for the Self Social Interpersonal Decision Making Scale.
Study Design	RCT
Source of funding	Not reported
Limitations	1. Small sample sizes 2. No follow-up to examine long-term retention of treatment effects 3. Assessment methods lack any formal assessment of reliability or validity
Notes	• N=9 dropouts, N=8 due prior to randomisation due to scheduling difficulties and/or unwillingness to continue

	participation and N=1 randomly excluded to balance sample sizes across groups

Study ID	KHEMKA2005
Bibliographic reference	Khemka, I., Hickson, L. & Reynolds, G. (2005) Evaluation of a decision-making curriculum designed to empower women with mental retardation to resist abuse. *American Journal of Mental Retardation, 110*, 193-204.
Methods	**Allocation:** Randomised **Matching:** Matched on decision making screening measure **Blindness:** Non-blind **Setting:** Community **Raters:** 2 independent raters **Country:** USA
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** WAIS or Stanford-Binet **N:** 36 **Age:** Range not reported (mean: 34 years) **Sex:** Male: 0; Female: 36 **Ethnicity:** 33.3% white, 50% African American, 16.7% Hispanic **IQ:** Range not reported (mean: 55.92) **Inclusion criteria:** Participants were required to be female, have an IQ of between 35 and 75, be aged 22-55 years, and live with natural/foster family or on own
Interventions	1. Effective Strategy-Based Curriculum for Abuse Prevention and Empowerment (ESCAPE) group (N=18) 2. Treatment as usual group (N=18) **Duration:** **Intervention:** 40-50min sessions once or twice a week over a 6-12 week period **Follow-up:** 12 weeks
Outcomes	The primary outcome was anti-victimization skills as assessed by the following measures: The Decision-Making Video Scale was used to measure decision-making skills in response to 12 hypothetical social interpersonal decision-making vignettes; Knowledge of Abuse Concepts Scale was used as a cognitive measure of knowledge of abuse concepts, the Empowerment Scale was used to assess perceptions of control and self-efficacy; the Stress Management Survey measured self-reported stress; and the Self Decision-Making Scale measured participants' ability to suggest self-protective decisions in response to simulated interpersonal situations involving different scenarios of sexual, physical, and verbal abuse. Data for the Decision-Making Video Scale was extracted.
Study Design	RCT
Source of funding	Grant from the Joseph P. Kennedy, Jr. Foundation
Limitations	1. Small sample size 2. High risk of attrition bias
Notes	• Data extracted for intention-to-treat sample

Study ID	KING1999
Bibliographic reference	King, N., Lancaster, N., Wynne, G., *et al*. (1999) Cognitive-behavioural anger management training for adults with mild intellectual disability. *Scandinavian Journal of Behaviour Therapy, 28*, 19-22.
Methods	**Allocation:** Not applicable – no control group **Matching:** Not applicable – no control group **Blindness:** Non-blind **Setting:** Community **Raters:** Self-report and caregiver report **Country:** Australia
Participants	**Diagnosis:** LD **Coexisting conditions:** N=3 cerebral palsy **Qualifying Diagnostic Assessment:** Not reported **N:** 11 **Age:** 17-48 years (mean: 29.5 years) **Sex:** Male: 7; Female: 4 **Ethnicity:** Not reported **IQ:** Not reported – mild intellectual disabilities **Inclusion criteria:** Participants were referred because of anger problems, all participants confirmed that they had an anger control problem and expressed a desire to change their behaviour. Participants demonstrating psychotic behaviour were excluded.
Interventions	1. Cognitive-behavioural anger management training program (N=11) **Duration:** **Intervention:** 15 90-min weekly sessions **Follow-up:** 27 weeks
Outcomes	The primary outcome was anger management, as assessed using self-report measures including the Anger Inventory for Mentally Retarded Adults, and the Coopersmith Self-esteem Inventory; and caregiver reports including Anger Inventory-Caregiver Report and Developmental Behaviour Checklist. Data is extracted for the Anger Inventory.
Study Design	Observational (before-and-after)
Source of funding	Not reported
Limitations	1. Small sample size 2. No control group 3. No correction applied for multiple statistical comparisons
Notes	

Study ID	LAUGESON2009
Bibliographic reference	Laugeson, E.A., Frankel, F., Mogil, C., *et al*. (2009) Parent-assisted social skills training to improve friendships in teens with autism spectrum disorders. *Journal of Autism & Developmental Disorders, 39*, 596-606.
Methods	**Allocation:** Randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Community **Raters:** Self- and parent-report **Country:** USA
Participants	**Diagnosis:** ASC **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 33 **Age:** 13-17 years (mean: 14.6 years) **Sex:** Male: 28; Female: 5 **Ethnicity:** Caucasian N:14, Hispanic/Latino N:6, African American **N:**3, Asian N:4, Middle-Eastern N:3, mixed ethnicities N:3 **IQ:** Range not reported (means: Treatment group mean VIQ=96, delayed treatment control mean VIQ=88.3 (KBIT-2)) **Inclusion criteria:** Participants were aged between 13 and 17 years, had social problems as reported by their parents, had a diagnosis of ASC, was fluent in English, had a parent or family member who was fluent in English, had a VIQ>70, had no history of major mental illness, and had no hearing, visual, or physical impairments which precluded participation in outdoor sports activities
Interventions	1. PEERS intervention group (N=17), with parents and teens attending separate concurrent sessions that instructed them on key elements about making and keeping friends 2. Delayed treatment group (N=16) **Duration:** **Intervention:** 12 90-min sessions delivered once a week over course of 12 weeks **Follow-up:** 24 weeks
Outcomes	The primary outcome was social interaction as measured by the parent-rated Social Skills Rating Scale (SSRS), and self-report scales as follows: The Quality of Play Questionnaire (QPQ), Test of Adolescent Social Skills Knowledge (TASSK), and Friendship Quality Scale (FQS). This study also collected data for teacher-report SSRS, however, sample sizes were not sufficient for analysis. Data was extracted for the Test of Adolescent Social Skills Knowledge
Study Design	RCT
Source of funding	NIH Training Grant T32-MH17140 and NIMH Grant 1U54MH068172
Limitations	1. Small sample size 2. Generalizability to real social situations needs to be examined
Notes	

Study ID	LEE1977
Bibliographic reference	Lee, D.Y. (1977) Evaluation of a group counseling program designed to enhance social adjustment of mentally retarded adults. *Journal of Counseling Psychology, 24*, 318-323.
Methods	**Allocation:** Randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Residential **Raters:** Key worker and fellow residents **Country:** Canada
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Peabody Picture Vocabulary Test **N:** 48 **Age:** 20-64 years (median: 37 years) **Sex:** Male: 22; Female: 26 **Ethnicity:** Not reported **IQ:** 12-87 (mean: 47) **Inclusion criteria:** Participants were mentally retarded residents of institution. Those residents under heavy medication during the time of this study and those severely handicapped in speech and hearing were excluded.
Interventions	1. Social adjustment training (N=20) 2. Treatment as usual (N=24) **Duration:** **Intervention:** 1 hour session 3 times a week for 10 weeks. Upon completion of the program the entire 15 sessions were repeated. **Follow-up:** 10 weeks
Outcomes	The outcome of interest was challenging behaviour as assessed by Part 2 of the AAMD Adaptive Behavior Scale (Nihira et al., 1974). The study also reports on the effects of social learning on social interaction. However, as this is an LD population we are only extrapolating for challenging behaviour outcomes.
Study Design	RCT
Source of funding	Not reported
Limitations	1. Small sample size 2. High risk for attrition bias
Notes	-N=4 dropped out of experimental group because of medical reasons or transfer to other institution

Study ID	LINDSAY2004
Bibliographic reference	Lindsay, W.R., Allan, R., Parry, C., *et al*. (2004) Anger and aggression in people with intellectual disabilities: treatment and follow-up of consecutive referrals and a waiting list comparison. *Clinical Psychology and Psychotherapy, 11*, 255-264.
Methods	**Allocation:** Non-randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Outpatient **Raters:** Self-report and blind raters for role-play videotapes **Country:** UK
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** WAIS-III **N:** 47 **Age:** Range not reported (means: Treatment group mean: 28.4 years; control group mean: 23.9 years) **Sex:** Male: 33; Female: 14 **Ethnicity:** Not reported **IQ:** Range not reported (means: Treatment group mean: 65.4; control group mean: 66.2) **Inclusion criteria:** Individuals who were known to the service and were now living in the community were referred back for reasons of aggression and destructive behaviour
Interventions	1. CBT for anger management (N=33) 2. Control group (N=14) **Duration:** **Intervention:** 9 months (around 40 sessions) **Follow-up:** 9 months
Outcomes	The primary outcome was anger management as measured by the Dundee Provocation Inventory (DPI) which measures anger related to frustration, disappointment, jealousy, embarrassment, anger towards self, and direct assault; ratings of role-plays which included 2 situations that were considered to be generally anger provoking and 1 that was specific to the participant involved; and self-reports of anger where participants completed an anger inventory on how they felt during each day. Data for the DPI were extracted
Study Design	Quasi-experimental (parallel groups)
Source of funding	Not reported
Limitations	1. Significant differences between control and experimental groups in age and gender 2. Significant baseline differences between groups 3. Discrepancy between sample sizes in experimental and control groups
Notes	• The treatment group was followed up to 30 months but with diminishing sample size and no data for control group. Data not extracted here for follow-ups.

Study ID	MATSON1981
Bibliographic reference	Matson, J.L., DiLorenzo, T.M. & Esveldt-Dawson, K. (1981) Independence training as a method of enhancing self-help skills acquisition of the mentally retarded. *Behaviour Research and Therapy, 19*, 399-405.
Methods	**Allocation:** Randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Residential **Raters:** Two psychiatric aides pretrained to a criterion of 90%+ reliability on rating showering skills **Country:** USA
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Stanford-Binet Intelligence Test and the American Association for Mental Deficiency Adaptive Behaviour Scale **N:** 72 **Age:** 21-55 years (mean: 32.2 years) **Sex:** Male: 46; Female: 26 **Ethnicity:** Not reported **IQ:** Not reported - moderate to severe LD **Inclusion criteria:** All participants were residents at a state institute for the mentally retarded. All residents in both groups were ambulatory and possessed the necessary motor skills and manual dexterity to participate in independent personal showering. Also, the residents had acquired a number of appropriate self-help skills prior to the beginning of the study, including self-toileting and independent dressing and feeding
Interventions	1. Independence training (N=36) 2. No-treatment control group (N=36) **Duration:** **Intervention:** 4 months **Follow-up:** 7 months
Outcomes	The primary outcome was activities of daily living, in this case, showering. The target behaviour, showering, was broken down into 27 task-analyzed steps and rated using a task-specific checklist
Study Design	RCT
Source of funding	Not reported
Limitations	1. Drug dosages were changed periodically throughout the study 2. Generalizability of findings 3. The task-specific checklist lacks formal assessments of reliability and validity
Notes	

Study ID	MAWHOOD1999
Bibliographic reference	Mawhood, L. & Howlin, P. (1999) The outcome of a supported employment scheme for high functioning adults with autism or asperger syndrome. *Autism, 3*, 229–254.
Methods	**Allocation:** Non-randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Not reported **Raters:** Self-report **Country:** UK
Participants	**Diagnosis:** ASC (formal diagnosis made by psychiatrist or psychologist; N=41 Asperger syndrome; N=6 autism; N=3 ASD) **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 50 **Age:** 18-55 years (means: supported work group mean: 31.1 years; control group mean: 28 years) **Sex:** Male: 47; Female: 3 **Ethnicity:** Not reported **IQ:** 66-128 (means: supported work mean: 98.8; control group mean: 97.7; as assessed by WAIS) **Inclusion criteria:** For supported work group: a formal diagnosis of autism or Asperger syndrome; IQ of 70 or above on either the performance or the verbal scale of the WAIS; actively seeking work (i.e. not registered simply because of parents' wishes or other pressures); able to travel independently and prepared to work within the Greater London area; capable of eventually managing employment with minimal support; no additional psychiatric or physical problems that would adversely affect employability. For control group: lived in metropolitan areas outside Greater London but otherwise met all eligibility criteria; all were actively seeking employment and none was receiving treatment for psychiatric or other problems that might have affected their ability to work; none of the cities in which the control group lived were in areas of high unemployment
Interventions	1. Supported group (support workers responsible for job finding and job preparation and guidance provided on full-time basis for first 2-4 weeks of employment) (N=30) 2. Control group (N=20) **Duration:** **Intervention:** 5-24 months (mean: 17 months) **Follow-up:** 24 months
Outcomes	Outcomes of interest were job placements, participant satisfaction (measured with a questionnaire based on that developed by Bass & Drewett, 1998) and self-esteem (measured with the Rosenberg Self-Esteem Inventory). Data could only be extracted for the number of job placements.
Study Design	Quasi-experimental (parallel groups)
Source of funding	Nuffield Foundation; Department of Employment; and The National Autistic Society
Limitations	

Notes	• Psychometric data are based on N=29 as one individual did not complete all assessments • By the end of the evaluation period N=5 no longer registered with scheme: N=1 moved out of the London area; N=1 failure to respond to letters and telephone calls; N=1 decided no longer wished to look for work; N=1 enrolled on full time course; and N=1 who had obtained permanent contract suddenly left job and declined further involvement • Follow-up 7-8 years later (HOWLIN2005) found that 13/19 who had found employment during the pilot project remained in permanent jobs

Study ID	MAZZUCCHELLI2001
Bibliographic reference	Mazzucchelli, T.G. (2001) Feel safe: a pilot study of a protective behaviours programme for people with intellectual disability. *Journal of Intellectual and Developmental Disability, 26*, 115-126.
Methods	**Allocation:** Non-randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Community **Raters:** Self-report and carer-report scales **Country:** Australia
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 20 **Age:** Range not reported (means: Experimental group mean: 31 years; control group mean: 37 years) **Sex:** Male: 5; Female: 15 **Ethnicity:** Not reported **IQ:** Range not reported (means: Experimental group mean: 56.3; control group mean: 60.3) **Inclusion criteria:** Clients that staff and carers felt would benefit from the programme were nominated and offered a time to attend a group, those who said they would be able to attend made up the experiential group and those who could not make that time made up the waiting list control group
Interventions	1. Feel Safe program to increase personal safety skills (N=10) 2. Waiting list control group (N=10) - participants who could not make the allocated time slots for treatment **Duration:** **Intervention:** One 3-hour session a week over 4 weeks **Follow-up:** 9 weeks
Outcomes	The primary outcome was anti-victimization skills. The Feel Safe Questionnaire (FSQ) was used to assess knowledge of the Feel Safe sessions, including: early warning signs (body feelings), empowerment and relaxation, the right to feel safe, emergencies, linking safety with adventurousness, networking, persistence expectation, and problem solving. The Protective Behaviour Skills Evaluation (PBSE) was used to obtain a measure of the degree to which participants actually applied protective behaviour strategies and concepts. Finally, Comprehensive Quality of Life Scale Intellectual Disability - Fourth Edition (ComQol-ID4) was used. Data was extracted for the PBSE.
Study Design	Quasi-experimental (parallel groups)
Source of funding	Not reported
Limitations	1. Potential bias in group allocation 2. Small sample size
Notes	

Study ID	MYLES1996A
Bibliographic reference	Myles, B.S., Simpson, R.L. & Smith, S.M. (1996) Collateral behavioral and social effects of using facilitated communication with individuals with autism. *Focus on Autism and Other Developmental Disabilities, 11*, 163-169.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Not applicable - no control group **Setting:** Educational **Raters:** Graduate research assistants **Country:** USA
Participants	**Diagnosis:** DSM-IV ASC **Coexisting conditions:** Moderate-to-severe LD **Qualifying Diagnostic Assessment:** Not reported **N:** 12 **Age:** 12-28 years (mean: 19.4 years) **Sex:** Male: 9; Female: 3 **Ethnicity:** White N: 9; African-American N:3 **IQ:** Not reported but LD **Inclusion/exclusion criteria:** Not reported
Interventions	1. Faciltated communication (N=12) in the classroom with the teacher acting as facilitator **Duration:** **Intervention:** 4 days per week for 14 weeks **Follow-up:** 17 weeks (including 3-week baseline observation period)
Outcomes	The primary outcome was the frequency of seven behaviours and social interaction outcomes as measured at baseline, during the intervention, and in the final few weeks of the intervention. These targeted behaviours included requesting, getting attention, protesting, giving information, expressing feelings, interacting socially, and non-focused response.
Study design	Observational (before-and-after study)
Source of funding	Grant No. H023A20093 from the US Department of Education, Office of Special Education Research, Division of Innovation and Development
Limitations	1. No control group 2. Efficacy data could not be extracted 3. Small sample size
Notes	• Participants were on concurrent medications during the study including flurazepam (N=1); thorazine (N=1); carbamazepine (N=2); klonopin (N=1); lithium (N=2); congentin (N=1); haldo (N=1); tegretol (N=1); lorazepam (N=1); depakote (N=2); benadryl (N=1); lamicta (N=1); dilantin (N=2); namictal (N=1); zoloft (N=1)

Study ID	POLIRSTOK2003
Bibliographic reference	Polirstok, S.R., Dana, L., Buono, S., *et al*. (2003) Improving functional communication skills in adolescents and young adults with severe autism using gentle teaching and positive approaches. *Topics in Language Disorders, 23*, 146-153.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Non-blind **Setting:** Residential **Raters:** Psychologist **Country:** Italy
Participants	**Diagnosis:** LD & >50% of group had diagnoses of autism or related autistic features **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** WAIS **N:** 18 **Age:** 16-38 years (mean not reported) **Sex:** Male: 0; Female: 18 **Ethnicity:** Not reported **IQ:** Not reported (mental age: 12-25 months) **Inclusion criteria:** Not reported
Interventions	1. Intensive Habilitation Program (N=18) targeting 4 main areas of preoccupational skills, occupational skills, psychomotor skills, and functional communication skills **Duration:** **Intervention:** One year of training **Follow-up:** 18 months
Outcomes	The primary measure was communication as measured by the Vineland Adaptive Behaviour Scale (VABS) with subscale of communication. Data extracted for expressive language.
Study Design	Observational (before-and-after)
Source of funding	Grant provided by the Italian Ministry of Education
Limitations	1. Small sample size 2. No control group 3. Limited description of methodology
Notes	

Study ID	ROSE2005
Bibliographic reference	Rose, J., Loftus, M., Flint, B., *et al*. (2005) Factors associated with the efficacy of a group intervention for anger in people with intellectual disabilities. *British Journal of Clinical Psychology, 44*, 305-317.
Methods	**Allocation:** Non-randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Community **Raters:** Self-report **Country:** Ireland
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 60 (N=38 for data extracted) **Age:** 17-60 years (means: CBT group mean: 36 years; additional stakeholder involvement group mean: 35 years; waiting list control mean: 33 years) **Sex:** Male: 30; Female: 30 **Ethnicity:** Not reported **IQ:** Not reported – borderline, mild, or moderate intellectual disability **Inclusion criteria:** Participants were from 3 work centres run by the same organization, all participants were recorded on clinical files as having borderline, mild, or moderate intellectual disability
Interventions	1. Psychoeducational anti-bullying intervention with a cognitive behavioural orientation (N=20) 2. Waiting list control group (N=18) Data was also reported for an additional group (N=22) which involved the same intervention but with additional involvement of community stakeholders. However, the data for this group is not extracted here. **Duration:** **Intervention:** 10 sessions **Follow-up:** 3 months
Outcomes	The primary outcome was anti-victimization skills as measured by self-reports of bullying behaviour and victimization, obtained using a modified version of the Bullying Questionnaire designed and produced by Mencap (1999), participants were asked to report whether they had experienced bullying in the past 3 months. A second question using the same format was devised to obtain self-report information on bullying behaviour. Dichotomous data for bullying victimization rates were extracted.
Study Design	Quasi-experimental (parallel groups)
Source of funding	Not reported
Limitations	1. Small sample sizes 2. More directly measured outcomes (i.e. in addition to self-reports of bullying) are needed including independent observation of incidents of bullying 3. Generalization of effects outside of the work centre environment needs to be explored
Notes	

Study ID	RUSSELL2009
Bibliographic reference	Russell, A.J., Mataix-Cols, D., Anson, M.A.W., *et al*. (2009) Psychological treatment for obsessive-compulsive disorder in people with autism spectrum disorders - a pilot study. *Psychotherapy and Psychosomatics, 78*, 59-61.
Methods	**Allocation:** Non-randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Outpatient **Raters:** Not reported **Country:** UK
Participants	**Diagnosis:** ICD-10 ASC **Coexisting conditions:** OCD. 50% of the CBT group and 42% of the treatment as usual group had additional psychopathology and the majority of additional diagnoses were of recurrent uni-polar depression or anxiety disorder **Qualifying Diagnostic Assessment:** ADI (in 67% of cases), ADOS (in 13% of cases) **N:** 24 **Age:** Range not reported (means: Treatment as usual group mean: 32.1 years; CBT group mean: 23.8 years) **Sex:** Male: 21; Female: 3 **Ethnicity:** Not reported **IQ:** Range not reported (means: Mean VIQ: 100.3; mean PIQ: 95.5 (WAIS-III)) **Inclusion criteria:** High-functioning adults with ASC and co-morbid OCD who were referred to specialist ASC clinic
Interventions	1. CBT for OCD, comprising exposure and response prevention and cognitive appraisal of OCD-related beliefs (N=12) 2. Treatment as usual (N=12) **Duration:** **Intervention:** 10-50 (mean=27.5) treatment sessions **Follow-up:** Mean of 15.9 months
Outcomes	The primary outcome was treatment effects on co-existing conditions, in this case OCD, as measured by the Yale-Brown Obsessive Compulsive Scale (YBOCS) severity scale. OCD symptoms were carefully distinguished from the repetitive phenomena typically seen in ASC.
Study Design	Quasi-experimental (parallel groups)
Source of funding	South London and Maudsley NHS Foundation Trust
Limitations	1. The treatment as usual group were significantly older than the CBT group 2. Small sample size 3. Changes in medication were introduced at mid-treatment in some cases 4. In 50% of the CBT cases, the YBOCS was completed by the treating therapist 5. The CBT group had severer OCD symptoms at baseline, and the treatment effects may simply reflect a regression to the mean
Notes	

Study ID	TAYLOR2005
Bibliographic reference	Taylor, J.L., Novaco, R.W., Gillmer, B.T., *et al*. (2005) Individual cognitive-behavioural anger treatment for people with mild-borderline intellectual disabilities and histories of aggression: a controlled trial. *British Journal of Clinical Psychology, 44*, 367-382.
Methods	**Allocation:** Non-randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Inpatient forensic **Raters:** Self- and staff-reporters **Country:** UK
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** WAIS-R **N:** 36 **Age:** Range not reported (means: Treatment group mean: 29.4 years; control group mean: 29.9 years) **Sex:** Male: 36; Female: 0 **Ethnicity:** Not reported **IQ:** Range not reported (means: Treatment group mean: 67.1; control group mean: 70.7) **Inclusion criteria:** Male 18-60 years; FIQ 55-80; detained under sections of the Mental Health Act 1983; self-report total score ≧90 on the Novaco Anger Scale (NAS); self-report total score ≧55 on the Provocation Inventory (PI); no active (uncontrolled) Axis I mental disorder (DSM-IV); no presence of epilepsy that was judged to be intrinsic to the patient's anger/aggression problems; no plans for discharge or transfer during the 6-month period from the beginning of treatment
Interventions	1. CBT anger treatment guided by treatment manual of Taylor and Novaco (1999, 2005) (N=16) 2. Routine care control group (N=20) **Duration:** **Intervention:** 18 sessions consisting of 6-week psychoeducational preparatory phase, followed by 12-week treatment phase **Follow-up:** 4 months
Outcomes	The primary outcome was anger management. To measure anger disposition the Novaco Anger Scale (NAS) and the Anger Expression (AX) scale of the Spielberger State-Trait Anger Expression Inventory (STAXI) was used. The Provocation Inventory (PI) was used to measure disposition to anger reactivity across a range of potentially anger-provoking situations. The Anger Control subscale of the Anger Expression (AX) was used as an index of participants' capacity to regulate their anger. Finally, the Ward Anger Rating Scale (WARS) was used to rate the patients' behaviour during the previous 7 days. Data for the PI were extracted.
Study Design	Quasi-experimental (parallel groups)
Source of funding	Not reported
Limitations	1. Small sample size
Notes	

Study ID	TSE2007
Bibliographic reference	Tse, J., Strulovitch, J., Tagalakis, V., *et al*. (2007) Social skills training for adolescents with Asperger syndrome and high-functioning autism. *Journal of Autism and Developmental Disorders, 37*, 1960–1968.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Non-blind **Setting:** Outpatient **Raters:** Parent-report **Country:** Canada
Participants	**Diagnosis:** ASC **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 46 **Age:** 13-18 years (mean: 14.6 years) **Sex:** Male: 28; Female: 18 **Ethnicity:** Not reported **IQ:** Not reported **Inclusion criteria:** Adolescents were 13-18 years old and referred to the group from psychiatry and community clinics across the McGill University network, participants had a diagnosis of ASC, adequate language skills for participation in activities, and able to talk about their interests and to verbalize some goals for participation
Interventions	1. Social skills group (N=46) which combined psychoeducational and experiential methods of teaching social skills, with emphasis on learning through role play **Duration:** **Intervention:** 1-1.5 hour meetings held weekly for 12 weeks **Follow-up:** 12 weeks
Outcomes	The primary outcome was social interaction as measured by the parent-completed Social Responsiveness Scale (SRS) which measured children's social competence, and the Nisonger Child Behaviour Rating Form (N-CBRF) positive social subscale. Data were extracted for the SRS. A secondary outcome was challenging behaviour as measured by the Aberrant Behaviour Checklist (ABC) Irritability subscale and the Nisonger Child Behaviour Rating Form (N-CBRF) problem behaviour subscale. Data was extracted for ABC Irritability.
Study Design	Observational (before-and-after)
Source of funding	Not reported
Limitations	1. Small sample size 2. No control group 3. Incomplete data sets
Notes	

Study ID	WEBB2004
Bibliographic reference	Webb, B.J., Miller, S.P., Pierce, T.B., *et al*. (2004) Effects of social skill instruction for high-functioning adolescents with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities, 19*, 53-62.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Non-blind **Setting:** Community **Raters:** Parent-rated scale **Country:** USA
Participants	**Diagnosis:** ASC **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 10 **Age:** 12-17 years (mean: 14.8 years) **Sex:** Male: 10; Female: 0 **Ethnicity:** White N: 9; Asian N: 1 **IQ:** 81-132 (mean: 100.5) **Inclusion criteria:** Participants needed to have current educational eligibility for an ASC program, be aged 12-18 years, have receptive and expressive language ability >70 standard score s measured within last 3 years, be currently attending a general education classroom for at least 1 lesson a day, have a deficit in social skills, and have parental agreement to transport the child to and from sessions twice a week for the 10 week project
Interventions	1. SCORE social skills intervention (N=10) **Duration:** **Intervention:** 13 1-hour sessions twice a week for 6.5 weeks **Follow-up:** 10 weeks
Outcomes	The primary outcome was social interaction as assessed by role-play behavioural observations and the parent-completed Social Skills Rating System (SSRS) which was used as an index of parental perception of changes in the social skills of the participants. Data was extracted for the SSRS.
Study Design	Observational (before-and-after)
Source of funding	Not reported
Limitations	1. Small sample size 2. No control group
Notes	

1.3.2 Characteristics of excluded studies

ALANSARI1996

Reason for exclusion	This paper was from the LD sift but only 63% of sample had learning disabilities and all had co-morbid psychiatric diagnoses

APPLE2005

Reason for exclusion	Sample size was less than 10 per arm

ATTWOOD2004

Reason for exclusion	Descriptive paper

AZRIN1973

Reason for exclusion	Sample size is less than 10 per arm

BANZETT1991

Reason for exclusion	Sample size was less than 10 per arm

BARLOW2006

Reason for exclusion	Mean age <15 years

BARLOW2008

Reason for exclusion	Mean age <15 years

BAUMINGER2002

Reason for exclusion	Mean age <15 years

BEAUMONT2008

Reason for exclusion	Mean age <15 years

BIZARRA2009

Reason for exclusion	This paper was from the LD sift but only 44% of the study sample had LD

BOLTE2002

Reason for exclusion	Sample size was less than 10 per arm

BRODERICK2002

Reason for exclusion	Sample size was less than 10 per arm

CARROLL1978

Reason for exclusion	Sample size was less than 10 per arm

CARTER2005

Reason for exclusion	Sample size (N=5 with ASC)

CHALFANT2007

Reason for exclusion	Mean age <15 years

CRAIG2006

Reason for exclusion	Sample size was less than 10 per arm

DAVIS1991

Reason for exclusion	Mean age <15 years

DIXON1998

Reason for exclusion	Sample size was less than 10 per arm

DIXON2001

Reason for exclusion	Sample size was less than 10 per arm

DUNLAP1984

Reason for exclusion	Sample size was less than 10 per arm

EBERLIN1993

Reason for exclusion	Data could not be extracted as no statistical analysis is reported

EIKESETH2005

Reason for exclusion	Mean age <15 years

ELDEVIK2006

Reason for exclusion	Mean age <15 years

EPP2008

Reason for exclusion	No details given as to diagnosis of sample so cannot ascertain whether this is an ASC population

FARR2010

Reason for exclusion	Sample size was less than 10 per arm

FAYYAD2010

Reason for exclusion	Mean age <15 years

FELDMAN1992

Reason for exclusion	Data could not be extracted as no statistical analysis reported

FELDMAN2002

Reason for exclusion	Mean age <15 years

FIELD2001

Reason for exclusion	Mean age <15 years

FRANKEL2010

Reason for exclusion	Mean age <15 years

FRIMAN1994

Reason for exclusion	Letter to editor - no useable data

GEURTS2008

Reason for exclusion	Mean age <15 years

GHEZZI2007

Reason for exclusion	Descriptive paper

GREENBERG2008

Reason for exclusion	Mean age <15 years

GUTSTEIN2007

Reason for exclusion	Mean age <15 years

HARCHIK1990

Reason for exclusion	Sample size was less than 10 per arm

HAYS2007

Reason for exclusion	Descriptive paper

HIGBEE2002

Reason for exclusion	Sample size was less than 10 per arm

HUDSON1982

Reason for exclusion	Mean age <15 years

HUDSON2003

Reason for exclusion	Mean age <15 years

ISRAEL1993

Reason for exclusion	Data could not be extracted as no statistical analysis reported

KASHIMA1988

Reason for exclusion	Mean age <15 years

KAZDIN1993

Reason for exclusion	Not primary data

KEEL1997

Reason for exclusion	Data could not be extracted

KEELING2007

Reason for exclusion	Sample size and co-morbidity: LD population was small (N=11) and 3 had acquired brain injury

KENT1994

Reason for exclusion	Data could not be extracted as no statistical analysis reported

KIRKHAM1993

Reason for exclusion	Mean age <15 years

KOEGEL1988

Reason for exclusion	Sample size was less than 10 per arm

KRATOCHWILL2003

Reason for exclusion	Mean age <15 years

LAUD2009

Reason for exclusion	Mean age <15 years

LEGOFF2004

Reason for exclusion	Mean age <15 years

LEGOFF2006

Reason for exclusion	Mean age <15 years

LEUNG2003

Reason for exclusion	Mean age <15 years

LIM2007

Reason for exclusion	Mean age <15 years

LLEWELLYN2003

Reason for exclusion	Sample size was less than 10 per arm for statistical analysis as a cross-over design was used

LOVAAS1973

Reason for exclusion	Mean age <15 years

LOVELAND1991

Reason for exclusion	Sample size is less than 10 per arm for post-hoc tests for intervention efficacy

LUND1992

Reason for exclusion	Sample size was less than 10 per arm

MARTIN2003

Reason for exclusion	Mean age <15 years

MATSON1980A

Reason for exclusion	Data could not be extracted as ANOVA is 2x2x3

MATSON1980B

Reason for exclusion	Data could not be extracted as ANOVA is 2x3

MATSON1982

Reason for exclusion	Data could not be extracted as ANOVA is 3x1

MATSON1998

Reason for exclusion	Data could not be extracted as ANOVA is 2x2

MATSUMOTO2007

Reason for exclusion	Mean age <15 years

MAZURYK1978

Reason for exclusion	Mean age <15 years

MCCARRAN1990

Reason for exclusion	Sample size is less than ten participants per arm

MCCUBBIN1988

Reason for exclusion	Data could not be extracted as no measure of variability was reported

MCCLANNAHAN2002

Reason for exclusion	Data could not be extracted

MCGARRY1979

Reason for exclusion	Data could not be extracted as no statistical analysis reported

MCGREGOR1998

Reason for exclusion	Mean age <15 years

MCGREGOR1999

Reason for exclusion	Sample size was less than 10 per arm

MESIBOV1984

Reason for exclusion	Data could not be extracted

MESIBOV1990

Reason for exclusion	Data from MESIBOV1984

MEYER1987

Reason for exclusion	Sample size was less than 10 per arm

MICHIE1998

Reason for exclusion	Data could not be extracted

MILLER1973

Reason for exclusion	Mean age <15 years

MORAWSKA2007

Reason for exclusion	Mean age <15 years

MYLES1996B

Reason for exclusion	Duplicate data from MYLES1996A

NAJDOWSKI2010

Reason for exclusion	Sample size is less than ten participants per arm

NELSON1980

Reason for exclusion	Mean age <15 years

NIKOPOULOS2007

Reason for exclusion	Sample size was less than 10 per arm

NIND1996

Reason for exclusion	Sample size was less than 10 per arm

NIND1999

Reason for exclusion	Descriptive paper

NORVELL1989

Reason for exclusion	Sample size was less than 10 per arm

OCONNOR1996

Reason for exclusion	Descriptive paper

ODELL1977

Reason for exclusion	Descriptive paper

ONEILL2002

Reason for exclusion	Sample size is less than ten participants per arm

PASSERINO2008

Reason for exclusion	Sample size was less than 10 per arm

PEARSON1999

Reason for exclusion	Mean age <15 years

RIVERS2010

Reason for exclusion	Mean age <15 years

ROEYERS1996

Reason for exclusion	Mean age <15 years

ROSE2000

Reason for exclusion	Over-lapping (but smaller) data set with ROSE2005

ROSE2009

Reason for exclusion	Mean age <15 years

ROSSITER1998

Reason for exclusion	Sample size was less than 10 per arm

ROTATORI1979

Reason for exclusion	Sample size was less than 10 per arm

ROUTH1995

Reason for exclusion	Mean age <15 years

RUSSELL1999

Reason for exclusion	Mean age <15 years

SALLOWS2005

Reason for exclusion	Mean age <15 years

SCHALLER2005

Reason for exclusion	Data could not be extracted

SCHREIBMAN1991

Reason for exclusion	Sample size is less than ten participants per arm and mean age <15 years

SCHULTZ1992

Reason for exclusion	Mean age <15 years

SEUNG2006

Reason for exclusion	Mean age <15 years

SHORT1984

Reason for exclusion	Mean age <15 years

SILVER2001

Reason for exclusion	Data could not be extracted

SMITH1994

Reason for exclusion	Data could not be extracted as no statistical analysis is reported

SMITH2005

Reason for exclusion	Mean age <15 years

SOFRONOFF2004

Reason for exclusion	Mean age <15 years

SOFRONOFF2007

Reason for exclusion	Mean age <15 years

SPACCARELLI1992

Reason for exclusion	Mean age <15 years

STEELEMCCARRAN1990

Reason for exclusion	Sample size was less than 10 per arm

STRAIN2000

Reason for exclusion	Sample size was less than 10 per arm

TAANILA1998

Reason for exclusion	Mean age <15 years

TANAKA2010

Reason for exclusion	Mean age <15 years

TAVORMINA1975

Reason for exclusion	Mean age <15 years

TAYLOR2008

Reason for exclusion	Mean age <15 years

TAYLOR2009

Reason for exclusion	Data could not be extracted as 3x1 ANOVA

THOMPSON1996

Reason for exclusion	Mean age <15 years

THORELL2009

Reason for exclusion	Mean age <15 years

TO2000

Reason for exclusion	Data could not be extracted as no measure of variance reported

TRACE1977

Reason for exclusion	Sample size was less than 10 per arm

TYSON1991

Reason for exclusion	Data could not be extracted as no statistical analysis reported

USLU2006

Reason for exclusion	Mean age <15 years

VANOORSOUW2009

Reason for exclusion	Mean age <15 years

VARMA1992

Reason for exclusion	Mean age <15 years

WACHTEL2006

Reason for exclusion	Sample size was less than 10 per arm

WAGNER1975

Reason for exclusion	Descriptive paper

WEBSTERSTRATTON1994

Reason for exclusion	Mean age <15 years

WEINBLATT2008

Reason for exclusion	Mean age <15 years

WELLMAN2002

Reason for exclusion	Mean age <15 years

WHITTINGHAM2009

Reason for exclusion	Mean age <15 years

WILLIAMS1989

Reason for exclusion	Mean age <15 years

WILLIAMS2005

Reason for exclusion	Mean age <15 years

WOLFE2009

Reason for exclusion	Case studies

WONG2006

Reason for exclusion	Mean age <15 years

ZINGALE2008

Reason for exclusion	Mean age <15 years

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Zingale, M., Belfiore, G., Mongelli, V., *et al*. (2008) Organization of a family training service pertaining to intellectual disabilities. *Journal of Policy and Practice in Intellectual Disabilities, 5*, 69-72.

1.4 BIOMEDICAL INTERVENTIONS

1.4.1 Characteristics of included studies

Study ID	BELSITO2001
Bibliographic reference	Belsito, K.M., Law, P.A., Kirk, K.S., *et al*. (2001) Lamotrigine therapy for autistic disorder: a randomized, double-blind, placebo-controlled trial. *Journal of Autism and Developmental Disorders, 31*, 175-181.
Methods	**Allocation:** Randomised **Matching:** No matching **Blindness:** Double-blind **Setting:** Not reported **Raters:** Caregiver-report and clinician-rated **Country:** USA
Participants	**Diagnosis:** ASC **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** ADI-R **N:** 35 **Age:** 3-11 years (mean: 5.8 years) **Sex:** Male: 33; Female: 2 **Ethnicity:** Caucasian: N=22 **IQ:** Not reported **Inclusion criteria:** Children with a primary diagnosis of ASC Exclusion criteria: Children with autistic disorder associated with comorbid medical etiologies, such as fragile X syndrome or metabolic disorders were excluded. Children with severe or profound mental retardation in whom a definitive diagnosis of autism could not be made were excluded. No participants were taking concurrent medications for at least 1 month before entering the trial
Interventions	1. Lamotrigine (mean: 5mg/kg per day, administered twice daily) (N=14) 2. Placebo (N=14) **Duration:** **Intervention:** 12 weeks **Follow-up:** 18 weeks
Outcomes	Primary outcomes were autistic behaviours as measured by the Autism Behaviour Checklist (AUBC; Krug et al., 1993), the Pre-Linguistic Autism Diagnostic Observation Schedule (PL-ADOS; DiLavore et al., 1995); and the Childhood Autism Rating Scale (CARS; Schopler et al., 1988). Other outcomes included challenging behaviour as measured by the Aberrant Behaviour Checklist (ABC; Aman et al., 1985), and adaptive behaviour as measured by the Vineland Adaptive Behaviour Scales (VABS; Sparrow et al., 1984).
Study Design	RCT
Source of funding	GlaxoWellcome
Limitations	1. Narrative reporting of results does not allow for extraction of data to calculate effect sizes.
Notes	• The trial ended with a 4-week drug-free period but data not extracted for this • A total of 7 participants dropped out; N=5 from experimental

	group and N=2 from placebo group • Intention-to-treat analysis was not performed • The mean number of reported side effects for lamotrigine was 0.63 and for placebo 0.69. Insomnia and hyperactivity were the most frequently reported side effects.

Study ID	COOK1992
Bibliographic reference	Cook, E.H. Jr., Rowlett, R., Jselskis, C., *et al*. (1992) Fluoxetine treatment of children and adults with autistic disorder and mental retardation. *Journal of the American Academy of Child and Adolescent Psychiatry, 31*, 739-745.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Open-label **Setting:** Outpatient **Raters:** Treating clinician **Country:** USA
Participants	**Diagnosis:** DSM-III-R ASC (autistic disorder) **Coexisting conditions:** LD (profound N=3; severe N=7; moderate N=3; mild N=6, borderline N=2); OCD (N=3); impulse control disorder not otherwise specified (NOS) with self-injurious behaviour (SIB) (N=6); impulse control disorder NOS without SIB (N=5); cyclothymia (N=1); bipolar disorder NOS (N=1); eating disorder (N=1) **Qualifying Diagnostic Assessment:** Not reported **N:** 23 **Age:** 7-28 years (mean: 15.9 years) **Sex:** Male: 18; Female: 5 **Ethnicity:** Not reported **IQ:** Not reported but with LD Inclusion criteria: Consecutive series of patients treated with fluoxetine by child and adolescent psychiatrists at the Unversity of Chicago in an outpatient setting between 1988 and 1990.
Interventions	1. Fluoxetine (oral, dose range from 20mg every other day to 80mg/day) **Duration:** **Intervention:** 11-426 days (mean: 189 days) **Follow-up:** 11-426 days (mean: 189 days)
Outcomes	The primary outcome was symptom severity/improvement as assessed by the Clinical Global Impressions (CGI) scale. Two subscales were used. The first was an overall rating of severity of illness and therapeutic efficacy. The second was a rating limited to perseverations, compulsions, or rituals depending on the individual's particular difficulties
Study Design	Observational (before-and-after study)
Source of funding	Harris Center for Developmental Studies; NIMH Child and Adolescent Mental Health Academic Award MH00822
Limitations	1. Coexisting psychiatric conditions may threaten generalizability of findings

	2. No control group and efficacy data cannot be extracted 3. Small sample size 4. Question of indirectness as adolescent sample
Notes	• A group with learning disabilities and without autism were also studied, however, data is not extracted for this group • Concomitant psychotropic medication included neuroleptics (N=8); carbamazepine (N=1); lithium carbonate (N=2); clonidine and alprazolam (N=1); and methylphenidate (N=1) • 6/23 participants had side effects that significantly interfered with function or outweighed therapeutic effects. Side effects included hyperactivity, insomnia, elated affect, decreased appetite, behavioural problems, and maculopapular rash

Study ID	GAGIANO2005
Bibliographic reference	Gagiano, C., Read, S., Thorpe, L., *et al*. (2006) Short- and long-term efficacy and safety of risperidone in adults with disruptive behaviour disorders. *Psychopharmacology, 179*, 629-636.
Methods	**Allocation:** Randomised **Matching:** No matching **Blindness:** Double-blind **Setting:** Not reported **Raters:** Clinician-rated **Country:** Canada, UK, and South Africa
Participants	**Diagnosis:** DSM-IV LD **Coexisting conditions:** Conduct disorder, N=44; Disruptive behaviour disorder, N=13; Intermittent explosive disorder, N=11; Oppositional defiant disorder. N=5; and Antisocial personality disorder, N=4. **Qualifying Diagnostic Assessment:** IQ measured at screening using the Wechsler or Stanford-Binet IQ tests **N:** 77 **Age:** 18-59 years (mean not reported) **Sex:** Male: 47; Female: 30 **Ethnicity:** Not reported **IQ:** 35-83 (mean not reported) **Inclusion/exclusion criteria:** Participants aged 18-65 years and had a DSM-IV Axis I diagnosis of conduct disorder, oppositional defiant disorder, antisocial personality disorder, disruptive behaviour disorder, or intermittent explosive disorder. Participants also had to have a DSM-IV Axis II diagnosis of borderline intellectual functioning, or mild or moderate mental retardation, which represents an IQ range of 35-84. Participants were excluded if they had a diagnosis of schizophrenia and other psychotic disorders or pervasive developmental disorder; head injury as a cause of mental impairment (except for birth trauma); seizure disorder requiring medication; clinically relevant abnormal laboratory values outside the normal range; serious or progressive illnesses (including but not restricted to liver or renal insufficiency; cardiac, vascular, gastrointestinal, pulmonary, or endocrine disturbances; or HIV infection); history of tardive dyskinesia or neuroleptic malignant syndrome; or a known hypersensitivity to antipsychotics. Participants who had previously received risperidone for conduct disorder for more than 3 weeks and those who had received risperidone for fewer than 3 weeks and did not respond were also excluded.
Interventions	1. Risperidone (oral tablets, 1-4mg/day with a mean dose of 1.45/day) (N=39) 2. Placebo (oral tablets) (N=38) **Duration:** **Intervention:** 4 weeks **Follow-up:** 52 weeks (open-label continuation)
Outcomes	Primary outcome was symptom severity/improvement (as measured by the Clinical Global Impressions (CGI) Scale, Guy, 1976)
Study Design	RCT
Source of funding	Johnson & Johnson Pharmaceutical Research & Development

Limitations	1. Data for challenging behaviour outcome (ABC scores) could not be extracted
Notes	• Four participants in each group discontinued the study prematurely. No participant discontinued because of adverse events. Two in the placebo group and 1 in the risperidone group withdrew because of insufficient response • Allowable psychotropic medications other than risperidone included antidepressants, lithium, carbamazepine, and valproic acid. Anticholinergic medication was discontinued at study entry. Limited use of sedative and hypnotic medication was allowed. Concomitant use of medications for medical disorders was also allowed. • 25/38 of participants in the placebo group, and 21/39 participants in the risperidone group received concomitant medication • After double-blind RCT participants could enter open-label treatment with risperidone for 48 weeks

Study ID	HAESSLER2007
Bibliographic reference	Haessler, F., Glaser, T., Beneke, M., *et al*. (2007) Zuclopenthixol in adults with intellectual disabilities and aggressive behaviours: discontinuation study. *British Journal of Psychiatry, 190*, 447-448.
Methods	**Allocation:** Randomised **Matching:** No matching **Blindness:** Double-blind **Setting:** Predominantly residential **Raters:** Clinician-rated scale **Country:** Germany
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 39 **Age:** 18-50 years (mean not reported) **Sex:** Not reported **Ethnicity:** Not reported **IQ:** 30-70 (mean not reported) **Inclusion/exclusion criteria:** All participants scored below 39 on the Disability Assessment Schedule (Holmes et al., 1982). Exclusion criteria were the presence of a diagnosed neurological disorder (without epilepsy), psychotic disorder, infantile cerebral palsy, hypersensitivity to zuclopenthixol and cardiac abnormalities. Female participants who were sexually active and did not use an effective form of birth control were also excluded.
Interventions	1. Zuclopenthixol (2-20mg/day, mean=11.4mg/day) (N=19) 2. Placebo (N=20) **Duration:** **Intervention:** Up to 12 weeks (discontinuation period) **Follow-up:** 18 weeks
Outcomes	Primary outcome was the challenging behaviour, aggression (as measured by the Modified Overt Aggression Scale (MOAS), Yudofsky et al., 1986). The outcome measure was dichotomous with participants rated as responders or non-responders. Patients with a deterioration of at least 3 points in MOAS sum scores at 2 subsequent visits when compared with their state at randomisation were designated as non-responders. All patients without deterioration were considered to be responders.
Study Design	RCT
Source of funding	Study medication and placebos provided by Bayer Vital GmbH
Limitations	-Low dosages of zuclopenthixol (6-18mg, mean 11.4mg) might be responsible for the relatively high relapse rates in the continuation (zuclopenthixol) subgroup -Small sample sizes
Notes	• Concomitant use of other antipsychotics was not permitted throughout the study. Use of consistent doses of anticonvulsants as well as lithium, medication for extrapyramidal symptoms and benzodiazepines as an anti-epileptic escape medication was permitted. • Psychotropic adjunctive medications given after randomisation (N=7) were equally distributed between the

	groups and involved the prescription of one benzodiazepine drug in each group. • This was a double-blind placebo controlled withdrawal study including responders from an open-label 6-week treatment with zuclopenthixol • The psychopharmacological mechanism of zuclopenthixol differs slightly from the dopaminergic-serotonergic impact of risperidone • The number of adverse events and possible symptoms of withdrawal, such as nausea, insomnia, and diarrhoea, were recorded and did not differ between the groups

Study ID	HANDEN2006
Bibliographic reference	Handen, B.L. & Hardan, A.Y. (2006) Open-label, prospective trial of olanzapine in adolescents with subaverage intelligence and disruptive behavioral disorders. *Journal of the American Academy of Child and Adolescent Psychiatry, 45*, 928-935.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Open-label **Setting:** Outpatient **Raters:** Primary caregiver-report **Country:** USA
Participants	**Diagnosis:** LD and disruptive behaviours **Coexisting conditions:** N=11 disruptive behaviour disorder (DBD); N=12 attention-deficit/hyperactivity disorder; (ADHD) N=2 oppositional defiant disorder (ODD); N=1 stereotypic movement disorder; N=1 anxiety disorder; N=1 conduct disorder (CD); N=1 impulse control disorder **Qualifying Diagnostic Assessment:** Not reported **N:** 16 **Age:** 13-17 years (mean: 14.7 years) **Sex:** Male: 10; Female: 6 **Ethnicity:** Not reported **IQ:** 36-79 (mean: 55) based on the most recently available test (typically conducted by the participant's school districts) Inclusion/exclusion criteria: Inclusion criteria included a minimum score at or above the 85th percentile for age and gender on the Irritability subscale of the Aberrant Behaviour Checklist (ABC). Axis I diagnoses included ADHD, ODD, CD, and DBD. Participants were excluded from the study if they had a diagnosis of schizophrenia or other psychotic disorder; ASC; mood disorder, bipolar disorder, or depressive disorder. Participants with an unstable seizure disorder (seizure within past 3 months), who were medically unstable or had significant medical or neurologic illness, were also excluded. Individuals who had been prescribed olanzapine for >3 weeks at >15mg/day were also excluded. Participants were allowed to continue any concomitant therapies with the exception of typical and atypical antipsychotics. For participants prescribed concomitant medications, stable doses of these medications were required for a minimum of 4 weeks before entering the study. In addition, no changes in dosing of concomitant therapies were allowed during the course of the study.
Interventions	1. Olanzapine (2.5-20mg/day; mean dose 13.7mg/day) (N=16) **Duration:** **Intervention:** 8 weeks **Follow-up:** 8 weeks
Outcomes	Primary outcomes were challenging behaviour (as measured by the Aberrant Behaviour Checklist (ABC), Aman et al., 1985) and symptom severity/improvement (Clinical Global Impressions - Severity (CGI-S)
Study Design	Observational
Source of funding	Not reported
Limitations	1. No control group

	2. Data could not be extracted to calculate effect sizes 3. Small sample size 4. Data could not be extracted for measures of adverse effects, for example, weight gain
Notes	• An intent-to-treat approach was used, with the last observation carried forward with missing data • An adjusted Bonferroni level of significance was used (p=0.0024) • N=4 subjects were terminated from the study prematurely because of significant side effects (N=2), worsening behaviour (N=2), or refusal to take medication (N=1)

Study ID	HARDAN2004
Bibliographic reference	Hardan, A.Y., Jou, R.J. & Handen, B.L. (2004) A retrospective assessment of topiramate in children and adolescents with pervasive developmental disorders. *Journal of Child and Adolescent Psychopharmacology, 14*, 426-432.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Open-label **Setting:** Outpatient **Raters:** Clinician-rated and parent-report **Country:** USA
Participants	**Diagnosis:** DSM-IV ASC (N=11 autistic disorder; N=2 Asperger's disorder; N=2 PDD-NOS) **Coexisting conditions:** **Qualifying Diagnostic Assessment:** All diagnoses made by board-certified child and adolescent psychiatrists with ASC experience **N:** 15 **Age:** 8-18 years (mean: 14.7 years) **Sex:** Male: 12; Female: 3 **Ethnicity:** Not reported **IQ:** Not reported **Inclusion criteria:** Participants treated with topiramate after their behavioural symptoms failed to respond to psychosocial interventions and at least 2 psychoactive agents. The study subjects were consecutive patients treated with topiramate. Participants taking other psychotropic medications were included only if their medications were unchanged. Exclusion criteria: None of the participants had serious medical or neurological disorders disorders, including seizure disorder.
Interventions	1. Topiramate (mean dose: 235mg ± 88mg/day) (N=15) **Duration:** **Intervention:** 8-56 weeks (mean: 25 weeks) **Follow-up:** 8-56 weeks (mean: 25 weeks)
Outcomes	Primary outcome was challenging behaviour as measured by the Conners Parent Scale (CPS; Goyette et al., 1978), and symptom severity/improvement as measured by the Clinical Global Impressions (CGI) scale, Global Improvement item (CGI-GI; Guy, 1976).
Study Design	Observational (case series)
Source of funding	NIMH grant MH 64027
Limitations	1. No control group and open-label so cannot get a rigorous and unbiased test of treatment efficacy
Notes	• N=3 discontinued topiramate because of side effects, N=2 cognitive difficulties such as disorientation and speech problems, and N=1 skin rash • 8/15 participants were rated as treatment responders (based on CGI-GI)

Study ID	HELLINGS2005
Bibliographic reference	Hellings, J.A., Weckbaugh, M., Nickel, E.J., *et al.* (2005) A double-blind, placebo-controlled study of valproate for aggression in youth with pervasive developmental disorders. *Journal of Child and Adolescent Psychopharmacology, 15*, 682-692.
Methods	**Allocation:** Randomised **Matching:** No matching **Blindness:** Double-blind **Setting:** Outpatient **Raters:** Parent-report and clinician-rated **Country:** USA
Participants	**Diagnosis:** ADI and ADOS ASC (N=27 Autistic Disorder; N=1 PDD-NOS; N=2 Asperger's disorder) and aggression **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** ADI and ADOS **N:** 30 **Age:** 6-20 years (mean: 11.2 years) **Sex:** Male: 20; Female: 10 **Ethnicity:** Caucasian N: 27; African-American N: 2; Hispanic N: 1 **IQ:** 20-137 (mean: 54) **Inclusion criteria:** Age 6-20 years, significant aggression to self, others, or property at least three times per week, and the presence of a PDD. All co-morbid DSM-IV Axis I diagnoses, except Tourette's Disorder, were allowed. Exclusion criteria: Previous adequate valproate trial for any indication or clinical seizures within the past year. Other exclusion criteria were a history of degenerative neurological changes or metabolic disorders, Tourette's Disorder, a history of thrombocytopenia, hepatitis, pancreatitis, pregnancy, or polycystic ovarian syndrome. Concomitant psychotropic or anti-seizure medications were not allowed. Stimulant medications were required to be stopped the day before placebo run-in commenced.
Interventions	1. Valproate (20mg/kg/day) (N=16) 2. Placebo (N=14) **Duration:** **Intervention:** 8 weeks **Follow-up:** 8 weeks
Outcomes	Primary outcome was challenging behaviour as measured by the parent-rated Aberrant Behaviour Checklist-Community scale (ABC-C; Aman et al., 1995) and the Overt Aggression Scale (OAS; Yudofsky et al., 1986). In addition symptom severity/improvement was measured with the Clinical Global Impression (CGI) - Improvement subscale (CGI-I) as rated by the principal investigator.
Study Design	RCT
Source of funding	Grant from the National Institute of Mental Health (1K08MH01561-01), the National Institute of Child Health and Human Development (HD26927, HD02528), and an unrestricted $5000 grant from Abbott Pharmaceuticals.
Limitations	1. Small sample size 2. Heterogeneity of sample with large differences in aggression frequency and severity for different weeks during the 8-week period

	and large standard deviations reported for each of the measures 3. Placebo response problems
Notes	• N=3 in the experimental group and N=2 in the control group dropped out. N=1 discontinued due to skin rash. • An intent-to-treat analysis was performed. • Teacher-ratings were also collected but only parent-ratings were used in the data analysis and reported. • Dichotomous data extracted for side effects with 'any side effect present during the trial' rated as event • Multiple outcome measures so data extracted consistent with the previous literature with CARS scores extracted as a measure of autistic behaviours, and ABC Irritability as a measure of challenging behaviour.

Study ID	HELLINGS2006
Bibliographic reference	Hellings, J.A., Zarcone, J.R., Reese, R.M., *et al*. (2006) A crossover study of risperidone in children, adolescents and adults with mental retardation. *Journal of Autism and Developmental Disorders, 36*, 401-411.
Methods	**Allocation:** Randomised **Matching:** Not applicable - Crossover study **Blindness:** Double-blind **Setting:** Community **Raters:** Caregiver-report **Country:** USA
Participants	**Diagnosis:** ASC (90%): Learning disabilities (N=40), DSM-IV autism (N=28), PDD-NOS (N=8) **Coexisting conditions:** N=9 with epilepsy in remission for at least a year where dosages of antiseizure medications remained constant during the study **Qualifying Diagnostic Assessment:** WAIS-Revised, WISC-3rd ed., or Leiter International Performance Scale **N:** 40 **Age:** 8-56 years (mean: 22 years) **Sex:** Male: 23; Female: 17 **Ethnicity:** White N: 34, African American N: 3, Hispanic N: 1, Other **N:** 2 **IQ:** Not reported; 11 mild MR, 9 moderate MR, 11 severe MR, & 9 profound MR **Inclusion/exclusion criteria:** Aged 6-65 years, with LD (IQ<70), and at least 6 months' history of aggression, property destruction or self-injury, by caregiver report. In addition, baseline Irritability subscale scores rated on the Aberrant Behavior Checklist-Community (ABC-C) rating scale (Aman et al., 1985) were required to be above given norms for age, gender and setting as rated by the primary caregiver. Exclusion criteria were previous risperidone hypersensitivity, history of neuroleptic malignant syndrome, seizures within the past year, degenerative brain disease as assessed by history, and a problematic living situation such as lack of reliable caregiving. Prior treatment with risperidone was not an exclusion criterion.
Interventions	1. Low dose risperidone (liquid 1mg/day for children and

	adolescents; 2mg/day for adults) (N=39 but crossover so N=18 for analysis) 2. Placebo II (liquid) (N=33 but crossover so N=17 for analysis) High dose and placebo I interventions were also reported but not analysed here as the study found no difference between high and low doses of risperidone in behavioural outcomes but significantly more adverse effects of the high dose intervention and placebo I was used in the paper as a co-variate for analysis **Duration:** **Intervention:** 3-5 weeks per intervention **Follow-up:** 22 weeks (open-label continuation)
Outcomes	The primary outcome of interest was the challenging behaviour, irritability, as measured by the Aberrant Behaviour Checklist (ABC-C).
Study Design	RCT (crossover)
Source of funding	National Institute of Child Health and Human Development
Limitations	1. Rater blinding may have been compromised as participants received drug at predictable stages due to study design 2. Broad age range 3. IQ test was only performed if one had not been completed by participant in the last 3 years 4. No qualifying diagnostic assessment used 5. Adverse events, such as increased appetite and weight gain were narratively described but not statistically quantified.
Notes	12 participants did not complete the trial (N=6 due to side effects, N=3 due to insufficient response, N=1 due to development of seizure reoccurrence, N=2 were lost to follow-up)

Study ID	HOLLANDER2010
Bibliographic reference	Hollander, E., Chaplin, W., Soorya, L., *et al*. (2010) Divalproex sodium vs placebo for the treatment of irritability in children and adolescents with autism spectrum disorders. *Neuropsychopharmacology, 35*, 990-998.
Methods	**Allocation:** Randomised **Matching:** No matching **Blindness:** Double-blind **Setting:** Outpatient **Raters:** Blinded clinical psychologist **Country:** USA
Participants	**Diagnosis:** DSM-IV-TR ASC (N=23 autistic disorder; N=4 Asperger's syndrome) **Coexisting conditions**: Not reported **Qualifying Diagnostic Assessment:** ADI-R and ADOS-G **N:** 27 **Age:** 5-15 years (mean: 9.5 years) **Sex:** Male: 23; Female: 4 **Ethnicity:** White N=8; Hispanic N=6; Black N=6; Asian N=3; Other N=2; More than one race N=2 **IQ:** 30-126 (mean: 63.3) **Inclusion criteria:** Participants were children 5-17 years, outpatients, who met DSM-IV-TR diagnostic criteria for autistic disorder, full diagnostic criteria on the ADI-R and autism spectrum criteria on the ADOS-G. Participants had to be at least moderately ill (CGI-Severity score of at least 4) to justify exposure to this medication. The population was also stratified for significant irritability/aggression difficulties at baseline, such that children had an Overt Agression Scale-Modified (OAS-M) score of at least 13 or an Aberrant Behaviour Checklist (ABC)-Irritability score of at least 18 (raw scores) to qualify. Exclusion criteria: Excluded sexually active and pregnant females and nursing mothers; subjects with overall adaptive behaviour scores below the age of 2 years on the Vineland Adaptive Behaviour Rating Scale; participants with active or unstable epilepsy, other Axis I disorders, unstable medical illness, genetic syndromes, or congenital infections associated with autism-like syndromes, prematurity; participants treated within the previous 30 days with any drug known to have a well-defined potential for toxicity or with any psychotropic drugs; participants with clinically significant abnormalities in laboratory tests or physical examination; subjects with a history of hypersensitivity or severe side effects associated with the use of divalproex sodium or other other ineffective previous therapeutic trial of divalproex sodium (serum levels within the range of 50-100µg/ml for 6 weeks); and participants who had begun any new non-medication treatments, such as diet, vitamins, and psychosocial therapy, within the previous 3 months.
Interventions	1. Divalproex sodium (valproate) (N=16) 2. Placebo (N=11) **Duration:** **Intervention:** 12 weeks **Follow-up:** 12 weeks
Outcomes	Primary outcome measures were challenging behaviour as measured by the Clinical Global Impression (CGI) scale focusing on irritability

	(CGI-I) and the irritability subscale of the Aberrant Behaviour Checklist (ABC). Secondary outcome measures of challenging behaviour included the Overt Aggression Scale-Modified (OAS-M). The core ASC symptom of repetitive behaviour was also assessed using the Child-Yale-Brown Obsessive-Compulsive Scale (CYBOCS).
Study Design	RCT
Source of funding	NNDS R21 NS4 3979-01, E Holander, PI. Active medication and placebo provided by Abbott Laboratories. Also, Grant Number MO1-RR00071 from the National Center for Research Resources (NCRR), a component of the National Institute of Health (NIH).
Limitations	1. The placebo group had a significantly higher mean full-scale IQ than the experimental group. IQ was used as a covariate and results were unchanged. However, this difference was not controlled for in the data extracted 2. Small sample size
Notes	• N=3 withdrew before week 12 (N=2 on divalproex sodium, N=1 on placebo). Only one participant in experimental group discontinued because of side effects. • Intent-to-treat approach to analysis used. • Dichotomous data extracted for CGI-Irritability with data extracted as reported for responders and non-responders. • No significant differences in weight gain between groups: Placebo weight gain=2.95lbs (3.37), experimental weight gain=3.02lbs (6.41).

Study ID	IZMETH1988
Bibliographic reference	Izmeth, M.G.A., Khan, S.Y., Kumarajeewa, D.I.S.C., *et al*. (1988) Zuclopenthixol decanoate in the management of behavioural disorders in mentally handicapped patients. *Pharmatherapeutica, 5*, 217-227.
Methods	**Allocation:** Randomised **Matching:** No matching **Blindness:** Double-blind **Setting:** Inpatient **Raters:** Clinicians **Country:** UK
Participants	**Diagnosis:** LD **Coexisting conditions:** Most patients had concurrent illness. The principal disorders were psychiatric (N=24) and epilepsy (N=29). The behavioural disorders ranged from antisocial behaviour to physical aggression. **Qualifying Diagnostic Assessment:** Not reported **N:** 113 **Age:** 18-56 years (experimental group mean: 30 years; control group mean: 32 years) **Sex:** Male: 67; Female: 45; Not recorded: 1 **Ethnicity:** Not reported **IQ:** 20-80 (experimental group mean: 51; control group mean: 48) **Inclusion/exclusion criteria:** Mentally handicapped patients with

	associated behavioural and/or psychiatric disorders, aged 18-60 years, and who had been receiving treatment with zuclopenthixol for at least 12 weeks were eligible for inclusion. Pregnancy or serious physical illness were exclusion criteria.
Interventions	1. Zuclopenthixol decanoate (intramuscular injection, mean dose: 119mg/week) (N=57) 2. Placebo (oily base only, mean dose: 129mg/week) (N=56) **Duration:** **Intervention:** 12 weeks **Follow-up:** 12 weeks
Outcomes	Primary outcomes were symptoms severity/improvement (as measured by the Clinical Global Impression (CGI) Scale; Guy, 1976) and challenging behaviour (as measured by the Nurse's Observation Scale for In-patient Evaluation (NOISE-30) and the Specific Behaviour Rating Scale (SBRS) which was designed for this study.
Study Design	RCT
Source of funding	Not reported
Limitations	1. No data could be extracted for CGI or SBRS outcome measures as all reporting narrative. The only quantitative value of treatment effects on final scores reported was for the irritability subscale of the NOISE-30 and even here only a significance level and not an exact p-value was reported ($p<0.05$) 2. Higher attrition rate in the placebo group
Notes	• Prior to the 12-week double-blind period when participants were randomly allocated to zuclopenthixol or placebo all participants had received zuclopenthixol in a 4-week open-label phase • No significant differences in sex, age, IQ, severity of handicap or accomodation between groups • N=20 in the zuclopenthixol group received anti-Parkinsonian drugs • N=29 participants with co-existent epilepsy were receiving anticonvulsant drug treatment (carbamazepine, sodium valproate, phenytoin, sulthiame or phenobarbitone); N=16 in zuclopenthixol group and N=13 in placebo • 18 participants were withdrawn because of behavioural deterioration: N=4 in zuclopenthixol; N=14 in placebo

Study ID	KARSTEN1981
Bibliographic reference	Karsten, D., Kivimäki, T., Linna, S., -L., *et al*. (1981) Neuroleptic treatment of oligophrenic patients. A double-blind clinical multicentre trial of cis(Z)-clopenthixol and haloperidol. *Acta Psychiatrica Scandinavica, Suppl. 294*, 39-45.
Methods	**Allocation:** Randomised **Matching:** No matching **Blindness:** Double-blind **Setting:** Inpatient **Raters:** Psychiatrists and nursing staff **Country:** Finland
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 100 **Age:** Range not reported (mean age for cis(z)-clopenthixol group: 25 years; mean age for haloperidol group: 27 years) **Sex:** Male: 56; Female: 44 **Ethnicity:** Not reported **IQ:** Not reported **Inclusion/exclusion criteria:** The study included individuals with LD with symptoms like psychomotor excitation, agitation, and violence and who might benefit from the treatment of either cis(Z)-clopenthixol or haloperidol. Participants were excluded if they had concomitant serious somatic illness or pathological laboratory findings as well as pregnant or epileptic participants.
Interventions	1. Cis(z)-clopenthixol (available as 5 & 25mg tablets) (N=49) 2. Haloperidol (available as 1 & 4mg tablets) (N=49) **Duration:** **Intervention:** 12 weeks **Follow-up:** 12 weeks
Outcomes	Primary outcomes were symptom severity/improvement (as measured by the Clinical Global Impression (CGI), McGlasham, 1973, psychiatrists and nurses scale) and side effects (assessed with CGI)
Study Design	RCT
Source of funding	Not reported
Limitations	1. Range and mean for daily or final dosage not reported
Notes	• Identical placebo tablets were available as well. All participants were treated during the 12 weeks with both sets of tablets, only one set. however, contained active drug while the other set was placebo. • Two patients were withdrawn from the trial, one in each treatment group. Reasons for withdrawal not reported. • The most frequently encountered single side effects were extrapyramidal (especially parkinsonism) and anticholinergic • This study compares two antipsychotic drugs. For the statistical analysis of dichotomous data cis(z)-clopenthixol is treated as the experimental condition and haloperidol as the control condition • For data analysis for the symptom severity/improvement outcome the dichotomous data are entered as reported with

	improved as 'event' and unchanged or deteriorated as 'no event'. For the side effects analysis the data are calculated to produce dichotomous outcomes with no side effect rated as 'event' and all side effect categories (side effects interfering slightly with functioning, side effects interfering moderately with functioning, and side effects interfering markedly with functioning) summed to produce 'no event' total score

Study ID	MCDOUGLE1996
Bibliographic reference	McDougle, C.J., Naylor, S.T., Cohen, D.J., *et al*. (1996) A double-blind, placebo-controlled study of fluvoxamine in adults with autistic disorder. *Archives of General Psychiatry, 53*, 1001-1008.
Methods	**Allocation:** Randomised **Matching:** No matching **Blindness:** Double-blind **Setting:** Inpatient (N=9) and Outpatient (N=21) **Raters:** Clinician-rated scales **Country:** USA
Participants	**Diagnosis:** DSM-III-R & ICD-10 ASC (Autistic disorder) **Coexisting conditions:** N=1 fragile X syndrome, none of the other participants had a diagnosed genetic, metabolic or neurological cause for their syndrome **Qualifying Diagnostic Assessment:** ADI and ADOS **N:** 30 **Age:** 18-53 years (mean: 30.1 years) **Sex:** Male: 27; Female: 3 **Ethnicity:** Not reported **IQ:** 25-115 (mean: 79.9; as measured by WAIS-R for verbal and Leiter International Performance Scale for non-verbal participants) **Exclusion criteria:** Participants were excluded if they met DSM-III-R criteria for schizophrenia or had psychotic symptoms, if they had abused illicit substances within the previous 6 months, or if a notable medical condition, including seizure disorder, was identified. Women with positive serum pregnancy test results were excluded.
Interventions	1. Fluvoxamine maleate (200-300 mg/day; mean dose 276.7 mg/day) (N=15) 2. Placebo (200-300 mg/day; mean dose 283.3 mg/day) (N=15) **Duration:** **Intervention:** 12 weeks **Follow-up:** 12 weeks
Outcomes	Primary outcomes included the core autistic symptom of repetitive behaviour as measured by the Yale-Brown Obsessive Compulsive Scale (Y-BOCS); autistic behaviours as measured by the Ritvo-Freeman Real-Life Rating Scale; challenging behaviour (aggression) as measured by the Brown Aggression Scale (Brown et al., 1979); maladaptive behaviour as measured by the Vineland Adaptive Behaviour Scale; and symptom severity/improvement as measured by the Clinical Global Impressions (CGI) scale
Study Design	RCT
Source of funding	National Alliance for Research on Schizophrenia and Depression Young Investigator Award; the State of Connecticut Deaprtment of Mental Health and Addiction Services; The Korczak Foundation for Autism and Related Disorders; and grants M01 RR06022-33, P50 MH30929-18, HD 03008-27, and P01 MH25642 from the National Institutes of Health, Bethesda, Md. Fluvoxamine and financial support were provided by Solvay Pharmaceuticals, Marietta, Ga.
Limitations	1. Small sample size 2. Y-BOCS scale valid and reliable for assessing severity of obsessive-compulsive symptoms in individuals with OCD but reliability and

	validity for assessing repetitive thoughts in autism is unknown
Notes	-All participants completed the trial. Fluvoxamine was well tolerated with no medically significant adverse events. N=4 reported nausea (N=3 in experimental and N=1 in control group) during the first 2 weeks but they experienced tolerance and were able to continue. N=3 experienced moderate sedation (N=2 in experimental; N=1 in control group), which also resolved.

Study ID	MCDOUGLE1998B
Bibliographic reference	McDougle, C.J., Brodkin, E.S., Naylor, S.T., *et al*. (1998) Sertraline in adults with pervasive developmental disorders: a prospective open-label investigation. *Journal of Clinical Psychopharmacology, 18*, 62-66.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Open-label **Setting:** Outpatient (N=40) and inpatient (N=2) **Raters:** Clinician-rated scales **Country:** USA
Participants	**Diagnosis:** DSM-IV ASC (N=22 autistic disorder; N=6 Asperger's disorder; N=14 PDD-NOS) **Coexisting conditions:** Participants did not meet criteria for any other DSM-IV axis I or axis II disorder other than mental retardation (N=28) **Qualifying Diagnostic Assessment:** ADI & ADOS used to aid diagnosis **N:** 42 **Age:** 18-39 years (mean: 26.1 years) **Sex:** Male: 27; Female: 15 **Ethnicity:** White N: 36; black N: 5; Hispanic N: 1 **IQ:** 25-114 (mean: 60.5; as measured by the WAIS-R for verbal and the Leiter International Performance Scale for non-verbal participants) **Inclusion criteria:** Symptom severity entry screening criteria: a Yale-Brown Obsessive Compulsive Scale (Y-BOCS) score of >15 (verbal patients) or >7 (nonverbal patients); a Self-Injurious Behaviour Questionnaire (SIB-Q) score of 25 or greater; a Ritvo-Freeman Real-life Rating Scale overall score of 0.20 or greater; or a Vineland Maladaptive Behaviour Scale part 1 score of 14 or greater; or a Vineland Maladaptive Behaviour Scale part 2 score of 5 or greater. Exclusion criteria: Participants were excluded if they met DSM-IV criteria for a psychotic disorder or bipolar disorder or if a significant medical condition, including seizure disorder, was identified
Interventions	1. Sertraline (50-200 mg/day) (N=42) **Duration:** **Intervention:** 12 weeks **Follow-up:** 12 weeks
Outcomes	Primary outcomes included the core autistic symptom of repetitive behaviour as measured by the Yale-Brown Obsessive Compulsive Scale (Y-BOCS); autistic behaviours as measured by the Ritvo-Freeman Real-Life Rating Scale; maladaptive behaviour as measured by the Vineland Adaptive Behaviour Scale; and symptom severity/improvement as measured by the Clinical Global Impression scale (CGI) global improvement item score
Study Design	Observational (before-and-after study)
Source of funding	Educational grant from Pfizer Pharmaceuticals; MH-30929 from the National Institute of Mental Health; HD-03008 from the National Institute of Child Health and Human Development; an Independent Investigator Award from the National Alliance for Research on Schizophrenia and Depression; the Theodore and Vada Stanley Research Foundation; the State of Connecticut Department of Mental Health and Addiction Services; and a National Institute of Mental Health Research Unit on Pediatric Psychopharmacology grant to

	Indiana University
Limitations	1. No control group and efficacy data cannot be extracted 2. Small sample size 3. Y-BOCS scale valid and reliable for assessing severity of obsessive-compulsive symptoms in individuals with OCD but reliability and validity for assessing repetitive thoughts in autism is unknown
Notes	• Participants were psychotropic drug-free for at least 4 weeks before the start of the trial • 37/42 completed the trial and were included in the efficacy analysis. N=3 dropped out because of increased anxiety/agitation; N=1 because of a syncopal episode of undetermined cause; N=1 because of noncompliance • Side effects in the 37 completers included anorexia (N=1); headache (N=1); tinnitus (N=1); alopecia (N=1); weight gain (N=3); sedation (N=1); anxiety/agitation (N=2). No adverse cardiovascular, extrapyramidal, or proconvulsant effects were identified

Study ID	MCDOUGLE1998A
Bibliographic reference	McDougle, C.J., Holmes, J.P., Carlson, D.C., *et al*. (1998) A double-blind, placebo-controlled study of risperidone in adults with autistic disorder and other pervasive developmental disorders. *Archives of General Psychiatry, 55*, 633-641.
Methods	**Allocation:** Randomised **Matching:** No matching **Blindness:** Double-blind **Setting:** Outpatient (N=24), inpatient (N=7) **Raters:** Board certified psychiatrists **Country:** USA
Participants	**Diagnosis:** DSM-IV ASC: autism (N=17), PDD-NOS (N=14) **Coexisting conditions:** None reported **Qualifying Diagnostic Assessment:** Autistic Diagnostic Interview and the Autism Diagnostic Observation Schedule **N:** 31 **Age:** 18-43 years (mean: 28.1 years) **Sex:** Male: 22; Female: 9 **Ethnicity:** White N: 24, African American N: 6, Hispanic N: 1 **IQ:** Range not reported (mean: 54.6 on WAIS-R or Leiter International Performance Scale) **Inclusion/exclusion criteria:** Yale-Brown Obsessive Compulsion Scale (Y-BOCS) compulsion subscale score of greater than 10, Self-Injurous Behaviour Questionnaire (SIB-Q) score of 25 or greater or a Ritvo-Freeman Real-Life Rating Scale overall score of 0.20 or greater, no diagnosis of schizophrenia, psychotic symptoms or identified significant acute medical condition
Interventions	1. Risperidone (oral capsules, mean dose 2.9mg/day) (N=15) 2. Placebo (oral capsules, mean dose 3.9mg/day) (N=16) **Duration:** **Intervention:** 12 weeks **Follow-up:** 24 weeks (open-label continuation)
Outcomes	Primary outcomes were: autistic behaviours (as measured by Ritvo-Freeman Real-life Rating Scale, Freeman et al. 1986); the core ASC symptom of repetitive behaviour (as measured by the Yale-Brown Obsessive Compulsive Scale (Y-BOCS), Goodman et al., 1989); symptom severity/improvement (as measured by the Clinical Global Impression (CGI) scale, Guy, 1976); and the challenging behaviour, aggression (as measured by the Self-Injurious Behaviour Questionnaire (SIB-Q)).
Study Design	RCT
Source of funding	Supported in part by grants from the Public Health Service, Young Investigator Award, Independent Investigator Award from the National Alliance for Research in Schizophrenia and Depression, Theodore and Vada Stanley Foundation Research Awards Program, State of Connecticut, Department of Mental Health and Addiction Services, National Institute of Mental Health, Rockville
Limitations	1. Relatively short duration of intervention and no longer-term post-intervention follow-up
Notes	Subjects had not taken any psychotropic drugs for at least 4 weeks before the trial

Study ID	MCKENZIE1966
Bibliographic reference	McKenzie, M.E. & Roswell-Harris, D. (1966) A controlled trial of Prothipendyl (Tolnate) inmentally subnormal patients. *British Journal of Psychiatry, 112*, 95-100.
Methods	**Allocation:** Randomised **Matching:** No matching and an IQ difference between groups (experimental mean: 34.4 and control mean: 25.4) **Blindness:** Blinding of investigators and outcome assessor **Setting:** Inpatient **Raters:** Medical officer **Country:** UK
Participants	Diagnosis: LD Coexisting conditions: Not reported Qualifying Diagnostic Assessment: Not reported N: 40 Age: 14-42 years (mean age for males: 20.5 years; mean age for females: 26.2 years) Sex: Male: 20; Female: 20 Ethnicity: Not reported IQ: 19-58 as measured by Goodenough Draw-a-Man test (experimental group mean: 34.4; control group mean: 25.4) Inclusion/exclusion criteria: Each participant was given a complete physical examination to exclude intercurrent disease. All drugs except anticonvulsants were stopped for a month before commencement of the trial.
Interventions	1. Prothipendyl (oral tablets, 80mg (1 tablet) - 320mg (4 tablets) 6-hourly) (N=20) 2. Placebo (oral tablets) (N=19) Duration: Intervention: 16 weeks Follow-up: 16 weeks
Outcomes	Primary outcome was symptom severity/improvement as measured by clinical observation rating scale
Study Design	RCT
Source of funding	Smith Kline and French Laboratories Ltd. supplied the drug and placebo
Limitations	1. Pre-trial differences between experimental and control groups in IQ
Notes	-In the first week of the trial one participant was withdrawn at the request of her parents, the group to which she had been allocated is not explicitly reported, however, due to number discrepancies between groups the assumption was made that she had been allocated to the placebo group -IQ scores based on the 29 participants who were testable -Liver function was estimated in a random sample of 10 participants; a raised serum alkaline phosphatase level was found in several participants, and the start of the trial was postponed until the levels were within the normal range -Calculated dichotomous outcome for the clinical assessment with participants showing slight improvement, good improvement, very good improvement, or excellent improvement summed to provide 'event' score and participants showing no change or deterioration

	summed to provide 'no event' total score

Study ID	READ2007
Bibliographic reference	Read, S.G. & Rendall, M. (2007) An open-label study of risperidone in the improvement of quality of life and treatment of symptoms of violent and self-injurious behaviour in adults with intellectual disability. *Journal of Applied Research in Intellectual Disabilities, 20*, 256-264.
Methods	Allocation: Not applicable - no control group Matching: Not applicable - no control group Blindness: Open-label Setting: Outpatient Raters: Research nurse independent of investigator with caregiver-report Country: UK
Participants	Diagnosis: LD Coexisting conditions: N=8 with ASC (33.3%); N=13 with epilepsy (54.2%); and N=11 with organic behaviour disorder (45.8%). Qualifying Diagnostic Assessment: Not reported N: 24 Age: 16-65 years (mean: 27.4 years) Sex: Male: 19; Female: 5 Ethnicity: White N: 19; Black N: 2; Asian N: 3 IQ: Not reported; N=18 (75%) with severe or profound LD Inclusion/exclusion criteria: Not reported
Interventions	1. Risperidone (oral tablet of 1, 3 or 4mg, or oral suspension of 1mg/mL; final dose 0.5-6mg/day, mean final dose: 2.92mg/day) (N=24) Duration: Intervention: 4-103 days (mean duration of treatment: 76.4 days) Follow-up: 76.4 days
Outcomes	Primary outcome was challenging behaviour (as measured by the Aberrant Behaviour Checklist (ABC), Aman et al., 1985). Secondary outcomes included symptom severity/improvement (as measured by the Clinical Global Improvement - severity scale (CGI-S)) and quality of life (as measured by a modified version of the Composite Autonomic Symptom Scale (COMPASS)).
Study Design	Observational
Source of funding	Not reported
Limitations	1. No control group 2. Data could not be extracted to calculate effect sizes
Notes	-No antipsychotic treatments other than risperidone were allowed during the trial; use of these was stopped at trial entry and there was no wash-out period -Doses of medication used to treat organic disorders were maintained constant -The primary efficacy variable was the change from baseline to final visit (last observation carried forward, LOCF) -N=3 discontinued the study: N=2 withdrew consent (at weeks 4 and 6); N=1 had abnormal electrocardiogram readings following screening and was therefore ineligible to continue -Increases in body weight were modest (P=0.061) and decreases in systolic blood pressure (p=0.191) and diastolic blood pressure

	(p=0.031) were not clinically significant

Study ID	REMINGTON2001
Bibliographic reference	Remington, G., Sloman, L., Konstantareas, M., *et al*. (2001) Clomipramine versus haloperidol in the treatment of autistic disorder: a double-blind, placebo-controlled, crossover study. *Journal of Clinical Psychopharmacology, 21*, 440-444.
Methods	**Allocation:** Randomised **Matching:** Not applicable - crossover study **Blindness:** Double-blind **Setting:** Outpatient **Raters:** Independently by two researchers **Country:** Canada
Participants	**Diagnosis:** DSM-IV ASC **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Diagnosis independently confirmed by two of the investigators who specialize in autistic disorder **N:** 36 **Age:** 10-36 years (mean: 16.3 years) **Sex:** Male: 30; Female: 6 **Ethnicity:** Not reported **IQ:** Not reported **Inclusion/exclusion criteria:** Evidence that haloperidol or clomipramine had not been used previously or, if so, that an adequate therapeutic trial was not completed
Interventions	1. Clomipramine (Oral capsules, final dose 100-150 mg/day, mean 123 mg/day) (N=36 but N=18 for analysis as crossover study) 2. Haloperidol (Oral capsules, final dose 1-1.5mg/day) (N=36 but N=18 for analysis as crossover study) 3. Placebo (Oral capsules) (N=36 but N=18 for analysis as crossover study) **Duration:** **Intervention:** 6 weeks per intervention **Follow-up:** 21 weeks
Outcomes	Primary outcome measures were: autistic behaviours (as measured by the Childhood Autism Rating Scale (CARS), Schopler et al., 1980); and side effects (as measured by the Dosage Treatment Emergent Symptom Scale (DOTES) as global measure of side effects and Extrapyramidal Symptom Rating Scale (ESRS) to specifically evaluated drug-induced EPS)
Study Design	RCT (crossover)
Source of funding	Ontario Mental Health Foundation
Limitations	1. Potential carryover effect due to crossover design and short duration of washout phase 2. Data reported did not allow calculation of effect size for ABC scores
Notes	• 12/32 participants completed the clomipramine trial (dropouts due to fatigue or lethargy (n=4), tremors (N=2), tachycardia (n=1), insomnia (n=1), diaphoresis (n=1), nausea or vomiting (n=1), decreased appetite (n=1), behavioural problems (n=8). N=1 categorised as side effects but dropped out because of previous electrocardiogram results • 23/33 participants completed the haloperidol trial (dropouts

	due to fatigue (n=5), dystonia (n=1), depression (n=1), behavioural problems (n=4) • 21/32 participants completed the placebo trial (dropouts due to behavioural problems (n=10), nosebleeds (n=1) • Benztropine (antiparkinsonian could be used as required throughout the study)

Study ID	SINGH1992
Bibliographic reference	Singh, I. & Owino, J. E. (1992) A double-blind comparison of zuclopenithixol tablets with placebo in the treatment of mentally handicapped in-patients with associated behavioural disorders. *Journal of Intellectual Disability Research, 36*, 541-549.
Methods	Allocation: Randomised Matching: No matching but no major differences in patient characteristics and no significant difference in the patient distribution according to the severity of mental handicap. Blindness: Double-blind Setting: Inpatient Raters: Clinicians Country: UK
Participants	Diagnosis: LD Coexisting conditions: Physical disorders (N=21); epilepsy (N=15); psychiatric disorders (N=9) Qualifying Diagnostic Assessment: Not reported N: 52 Age: 33-60 years (means: 34 and 38 years in experimental and control groups respectively) Sex: Male: 28; Female: 24 Ethnicity: Not reported IQ: Not reported; mild learning disabilities (N=1); moderate learning disabilities (N=17); severe learning disabilities (N=34) Inclusion/exclusion criteria: Participants had learning disabilities, 16-65 years. Exclusion criteria were confirmed or possible pregnancy, severe concomitant diseases, or treatment with depot neuroleptics in the last 3 months.
Interventions	1. Zuclopenthixol (oral tablets, 10-150mg/day, modal dose 20mg/day) (N=27) 2. Placebo (equivalent number of oral tablets) (N=25) Duration: Intervention: 12 weeks (double-blind period), this followed on from 6-week open-label phase Follow-up: 18 weeks
Outcomes	Primary outcome measure was symptom severity/improvement (as measured by the Clinical Global Assessment (CGA) which was derived from the Clinical Global Impressions (Guy, 1986); The Behavioural Disorder Assessment; and a simplified UKU Side-effect Rating Scale (Lingjaerde et al., 1986))
Study Design	RCT
Source of funding	Not reported
Limitations	1. Higher attrition rate in placebo group
Notes	-This was a prospective study including a 6-week, open-label treatment phase in which all patients received zuclopenthixol dihydrochloride (10mg tablets) followed by a 12-week, randomised, placebo-controlled double-blind period using a parallel group design in which some participants discontinued active drug treatment and switched to placebo -Participants could receive the hypnotics nitrazepam and temazepam, anticonvulsants and the antiparkinson drug procyclidine. Antibiotics

	and other medication for somatic diseases were permitted -41 participants were taking neuroleptic medication at trial entry; 12 participants in the zuclopenthixol group and 8 in the placebo group were receiving antiparkinson drugs at entry -9 participants were excluded from the efficacy analysis either due to protocol violation (for example, receiving unpermitted additional medication), withdrawal from the single-blind phase, or receiving less than 2 weeks treatment in the double-blind phase -Of the 43 patients (zuclopenthixol N=24; placebo N=19) who remained eligible for efficacy analysis, 5 participants (all receiving placebo) were withdrawn from the study resulting in outcome data for zuclopenthixol N=24, placebo N=14 -No data could be extracted for Behavioural Disorder Assessment or UKU side-effect rating scale outcome measures as narrative description of results -Dichotomous data calculated for 'severity of behavioural disorder' on CGA with the number of participants causing fewer problems in management rated as 'events' and the number of participants remaining unchanged or causing more problems summed to create 'no events' total

Study ID	TYRER2008
Bibliographic reference	Tyrer, P., Oliver-Africano, P.C., Ahmed, Z., *et al*. (2008) Risperidone, haloperidol, and placebo in the treatment of aggressive challenging behaviour in patients with intellectual disability: a randomised controlled trial. *The Lancet, 371*, 57-63.
Methods	Allocation: Randomised Matching: No matching Blindness: Double-blind Setting: Community Raters: Keyworker-report and independent researcher Country: UK and Australia
Participants	Diagnosis: LD Coexisting conditions: N=14 (16%) had ASC Qualifying Diagnostic Assessment: Not reported N: 86 Age: 26-51 years (placebo group mean age: 43 years; Risperidone group mean age: 39 years; Haloperidol mean age: 37.5 years) Sex: Male: 53; Female: 33 Ethnicity: Not reported IQ: Not reported; N=1 borderline LD; N=30 mild LD; N=41 moderate LD; N=14 severe (profound) LD Inclusion/exclusion criteria: Individuals treated by services for intellectual disability (IQ<75) with all degrees of severity of LD, including those who had been given antipsychotic drugs in the past but no longer took them. Participants were required to have recent challenging behaviour and aggression (defined by at least two episodes of aggressive behaviour, with a total MOAS score of at least 4 in the past 7 days). Only those who had been previously diagnosed as having a psychosis were excluded. A possible ASC was not an exclusion criteria, provided that a clinical diagnosis of psychosis was absent. Patients who had taken depot antipsychotic drugs, or any other injected antipsychotic drug, within the past 3 months or continuous oral antipsychotic drugs within the past week, or those under a section of the Mental Health Act, 1983, (or the Queensland Mental Health Act, 2000 in the Australian group) at the time of assessment were excluded.
Interventions	1. Risperidone (oral tablets, 1mg-2mg/day) (N=29) 2. Haloperidol (oral tablets, 2.5mg-5mg/day) (N=28) 3. Placebo (oral tablets) (N=29) Duration: Intervention: 12 weeks Follow-up: 26 weeks (optional continuation)
Outcomes	The primary outcome was challenging behaviour (as measured by the Modified Overt Aggression Scale (MOAS), Sorgi et al., 1991; and the Aberrant Behaviour Checklist (community version) (ABC-C), Aman et al., 1985). Secondary outcomes included effect on carers (as measured by the uplift and burden scale, Pruchno, 1990), quality of life (as measured by the 40-item quality of life questionnaire, Schalock & Keith, 1993); side effects (as measured by the udvalg for kliniske undersogelser scale, Lingjaerde et al., 1987), and symptom severity/improvement (as measured by the Clinical Global Impression (CGI) scale, Guy, 1976)

Study Design	RCT
Source of funding	National Coordinating Centre for Health Technology Assessment (NCCHTA), Southampton, UK
Limitations	1. Results reported as median values and inter-quartile ranges which may indicate skewed data. As a result it is not possible to calculate effect sizes for this study 2. The statistical analysis reported compares scores at week 4 rather than at the week 12 end point 3. No data could be extracted for the ABC-C, the effect on carers, quality of life, or symptom severity/improvement 4. No adjustment was made for multiple statistical comparisons
Notes	-N=11 dropouts by week 12 in the Risperidone group; N=6 dropouts in the Haloperidol group; and N=8 drop-outs in the placebo group -Analysis was by intention to treat, inputting missing values by last observation carried forward -Baseline differences in MOAS scores controlled for in statistical analysis

Study ID	VANDENBORRE1993
Bibliographic reference	Vanden Borre, R., Vermote, R., Buttiëns, M., *et al*. (1993) Risperidone as add-on therapy in behavioural disturbances in mental retardation: a double-blind placebo-controlled cross-over study. *Acta Psychiatrica Scandinavica, 87*, 167-171.
Methods	Allocation: Randomised Matching: No matching Blindness: Double-blind Setting: In-patient Raters: Not reported Country: Belgium
Participants	Diagnosis: DSM-III-R LD Coexisting conditions: Not reported Qualifying Diagnostic Assessment: Not reported N: 37 Age: 15-58 years (mean: 30.5 years) Sex: Not reported Ethnicity: Not reported IQ: Not reported; severe or profound LD Inclusion/exclusion criteria: Individuals aged 15-65 years, of either sex, could be include in the study. A diagnosis of mild, moderate, severe, or profound mental retardation (DSM-III-R) had to be established. Despite optimisation of current treatment, participants presented such persistent behavioural disturbances as hostility, aggressiveness, irritability, agitation, hyperactivity, automutiliation and autism that required psychotropic medication. Participants suffering from a severe organic disease affecting the absorption, distribution, metabolism or excretion of the test drug or from a mental disorder other than the target diagnosis were excluded. Participants with a history of alcohol or drug abuse were also excluded, as were women with pregnancy potential, pregnancy or lactation.
Interventions	1. Risperidone (oral solution, 4-12mg/day, mean final dose 8.3mg/day) (N=37 but for analysis N=19 as this is a crossover study) 2. Placebo (oral solution) (N=37 but for analysis N=19 as this is a crossover study) Duration: Intervention: 3 weeks per intervention (total of 8 weeks) Follow-up: 8 weeks
Outcomes	Primary outcomes were symptoms severity/improvement (as measured by the Clinical Global Impressions (CGI) scale), and challenging behaviour (as measured by the Aberrant Behaviour Checklist (ABC))
Study Design	RCT (crossover)
Source of funding	Not reported
Limitations	1. Results reported for primary outcomes do not allow for a calculation of effect sizes 2. Results are indicative of group differences in adverse events. However, narrative description of results means data cannot be extracted in order to quantify this finding
Notes	-During the whole study period, the existing medication was to be

	continued unchanged. The consumption of concomitant medication was evenly distributed in both groups; buterophenones, phenothiazines and benzodiazepines were the most frequently used concomitant medicines. -Both groups were comparable in sex distribution, target symptom and diagnosis (mostly severe or profound mental retardation) -Two patients dropped out under placebo: one after 7 days because of agitation and one after 9 days because of extrapyramidal symptoms. Five patients dropped out under risperidone treatment: one because of an intercurrent event (respiratory infection) after 15 days; and 4 for adverse events, 1 for hypotension after 1 day, 1 for hypotension and sedation after 6 days, 1 for sedation after 7 days, and 1 because of agitation after 15 days. -All participants were included in the efficacy analysis and in the safety analysis -Adverse reactions were more numerous under risperidone treatment. Sedation was reported 10 times and drowsiness 6 times as a treatment-emergent adverse event under risperidone treatment; these symptoms did not emerge under placebo -There were no statistically significant changes in systolic or diastolic blood pressure, heart rate, ECG or body weight during this trial. No relevant alterations in haematology, blood biochemistry or urinalysis were detected.

Study ID	VANHEMERT1975
Bibliographic reference	van Hemert, J.C.J. (1975) Pipamperone (Dipiperon, R3345) in troublesome mental retardates: a double-blind placebo controlled cross-over study with long-term follow-up. *Acta Psychiatrica Scandinavica, 52*, 237-245.
Methods	Allocation: Randomised Matching: No matching Blindness: Double-blind Setting: Inpatient Raters: Not reported Country: Netherlands
Participants	Diagnosis: DSM II mental retardation Coexisting conditions: All participants presented strong aggressiveness or other troublesome behaviour, not induced by their environment (e.g. agitation or aggressiveness towards the other patients) Qualifying Diagnostic Assessment: Not reported N: 20 Age: 22-42 years (median: 33 years) Sex: Male: 0; Female: 20 Ethnicity: Not reported IQ: Not reported; N=9 moderate LD, N=10 severe LD, and N=1 profound LD Inclusion/exclusion criteria: Not reported
Interventions	1. Pipamperone (oral tablets, 40-80mg/day) (N=20, but N=10 for analysis as crossover study) 2. Placebo (oral tablets) (N=20, but N=10 for analysis as crossover study) Duration: Intervention: 3 weeks per intervention (total of 6 weeks) Follow-up: 4 months (open-label continuation)
Outcomes	Primary outcome was challenging behaviour (as measured by change scores on a 10-item scale)
Study Design	RCT (crossover)
Source of funding	Janssen Pharmaceutica provided the medication
Limitations	1. Results reported for primary outcomes do not allow for calculation of effect sizes
Notes	-Other psychotropic drugs, including hypnotics were not admitted -Both groups comparable as to age, diagnosis, and body weight at the onset of treatment -Apart from drowsiness in N=3 during pipamperone treatment, no side effects were reported or observed

1.4.2 Characteristics of excluded studies

ADVOKAT2000

Reason for exclusion	Co-morbid psychosis

ALKAISI1974

Reason for exclusion	Co-morbid epilepsy and the primary outcome is reduction of seizures

AMORE2011

Reason for exclusion	Significant baseline differences between groups in primary outcome measure not controlled for in analysis

ANAGNOSTOU2006

Reason for exclusion	Sample size is less than 10 participants per arm

BHAUMIK1997

Reason for exclusion	Co-morbid epilepsy

BOACHIE1997

Reason for exclusion	Co-morbid psychosis

BREUNING1982

Reason for exclusion	Data could not be extracted

BRODKIN1997

Reason for exclusion	Data could not be extracted

BUITELAAR2000

Reason for exclusion	Not LD, IQ>70

COSKUN2009

Reason for exclusion	Mean age <15 years

CRAFT1980

Reason for exclusion	Co-morbid psychosis

DRMIC2008

Reason for exclusion	Data could not be extracted

HELLINGS2010

Reason for exclusion	Data could not be extracted

HENRY2006

Reason for exclusion	Mean age <15 years

HENRY2009

Reason for exclusion	Mean age <15 years

HOLLANDER2000

Reason for exclusion	Mean age <15 years

HOLLANDER2005

Reason for exclusion	Mean age <15 years

KASTNER1993

Reason for exclusion	Co-morbid epilepsy

LOTT1996

Reason for exclusion	Data could not be extracted (narrative)

LYNCH1985

Reason for exclusion	Data could not be extracted

MALT1995

Reason for exclusion	Co-morbid psychosis

MOFFATT1970

Reason for exclusion	Co-morbid epilepsy

OWLEY2010

Reason for exclusion	Mean age <15 years

ROMEO2009

Reason for exclusion	Efficacy data duplicated from TYRER2008

RUEDRICH1999

Reason for exclusion	Co-morbid psychosis

RUEDRICH2008

Reason for exclusion	Co-morbid psychosis

RUGINO2002

Reason for exclusion	Data could not be extracted

THALAYASINGAM2004

Reason for exclusion	Data could not be extracted

TROOST2005

Reason for exclusion	Mean age <15 years

TYRER2009

Reason for exclusion	Data duplicated from TYRER2008

VALICENTIMCDERM2006

Reason for exclusion	Mean age <15 years

WASSERMAN2006

Reason for exclusion	Data could not be extracted. Time x group interaction data reported.

WEIR1968

Reason for exclusion	Data could not be extracted as the results from the comparison of interest are reported as NS

ZARCONE2001

Reason for exclusion	Sample size for analysis is less than 10 per arm as it is a crossover study

1.4.3 References of excluded studies

ADVOKAT2000
Advokat, C. D., Mayville, E. A. & Matson, J. L. (2000) Side effect profiles of atypical antipsychotics, typical antipsychotics, or no psychotropic medications in persons with mental retardation. *Research in Developmental Disabilities, 21*, 75-84.

ALKAISI1974
Al-Kaisi, A. H. & McGuire, R. J. (1974) The effect of sulthiame on disturbed behaviour in mentally subnormal patients. *British Journal of Psychiatry, 124*, 45-49.

AMORE2011
Amore, M., Bertelli, M., Villani, D., *et al*. (2011) Olanzapine vs. risperidone in treating aggressive behaviours in adults with intellectual disability: a single blind study. *Journal of Intellectual Disability Research, 55*, 210-218.

ANAGNOSTOU2006
Anagnostou, E., Esposito, K., Soorya, L., *et al*. (2006) Divalproex versus placebo for the prevention of irritability associated With fluoxetine treatment in autism spectrum disorder. *Journal of Clinical Psychopharmacology, 26*, 444-446.

BHAUMIK1997
Bhaumik, S., Branford, D., Duggirala, C., *et al*. (1997) A naturalistic study of the use of vigabatrin, lamotrigine and gabapentin in adults with learning disabilities. *Seizure, 6*, 127-133.

BOACHIE1997
Boachie, A. & McGinnity, M.G.A. (1997) Use of clozapine in a mental handicap hospital: Report of the first 17 patients. *Irish Journal of Psychological Medicine, 14*, 16-19.

BREUNING1982
Breuning, S.E. (1982) An applied dose-response curve of thioridazine with the mentally retarded: aggressive, self-stimulatory, intellectual, and workshop behaviors – a preliminary report. *Psychopharmacology Bulletin, 18,* 57-59.

BRODKIN1997
Brodkin, E.S., McDougle, C.J., Naylor, S.T., *et al*. (1997) Clomipramine in adults with pervasive developmental disorders: a prospective Open-Label investigation. *Journal of Child and Adolescent Psychopharmacology, 7*, 109-121.

BUITELAAR2000
Buitelaar, J.K. (2000) Open-label treatment with risperidone of 26 psychiatrically-hospitalized children and adolescents with mixed diagnoses and aggressive behaviour. *Journal of Child and Adolescent Psychopharmacology, 10*, 19-26.

COSKUN2009
Coskun, M., Karakoc, S., Kircelli, F., *et al*. (2009) Effectiveness of mirtazapine in the treatment of inappropriate sexual behaviors in individuals with autistic disorder. *Journal of Child and Adolescent Psychopharmacology, 19*, 203-206.

CRAFT1980
Craft, M.J. & Schiff, A.A. (1980) Psychiatric disturbance in mentally handicapped patients. A prospective study of current clinical usage of depot fluphenazine in hospitals for the mentally handicapped. *British Journal of Psychiatry, 137*, 250-255.

DRMIC2008
Drmić, S. & Franić, T. (2008) Effect of olanzapine on disruptive behavior in institutionalized patients with severe intellectual disability-a case series. *Collegium Antropologicum, 32*, 325-330.

HELLINGS2010
Hellings, J. A., Cardona, A.M. & Schroeder, S.R. (2010) Long-term safety and adverse events of risperidone in children, adolescents, and adults with pervasive developmental disorders. *Journal of Mental Health Research in Intellectual Disabilities, 3*, 132-144.

HENRY2006
Henry, C.A., Steingard, R., Venter, J., *et al*. (2006) Treatment outcome and outcome associations in children with pervasive developmental disorders treated with selective serotonin reuptake inhibitors: a chart review. *Journal of Child and Adolescent Psychopharmacology, 16*, 187-195.

HENRY2009
Henry, C.A., Shervin, D., Neumeyer, A., *et al*. (2009) Retrial of selective serotonin reuptake inhibitors in children with pervasive developmental disorders: a retrospective chart review. *Journal of Child and Adolescent Psychopharmacology, 19*, 111-117.

HOLLANDER2000
Hollander, E., Kaplan, A., Cartwright, C., *et al*. (2000) Venlafaxine in children, adolescents, and young adults with autism spectrum disorders: an open retrospective clinical report. *Journal of Child Neurology, 15*, 132-135.

HOLLANDER2005
Hollander, E., Phillips, A., Chaplin, W., *et al*. (2005) A placebo controlled crossover trial of liquid fluoxetine on repetitive behaviors in childhood and adolescent autism. *Neuropsychopharmacology, 30*, 582-589.

KASTNER1993
Kastner, T. F. (1993) Long-term administration of valproic acid in the treatment of affective symptoms in people with mental retardation. *Journal of Clinical Psychopharmacology, 13*, 448-451.

LOTT1996
Lott, R.S., Kerrick, J.M. & Cohen, S.A. (1996) Clinical and economic aspects of risperidone treatment in adults with mental retardation and behavioral disturbance. *Psychopharmacology Bulletin, 32*, 721-729.

LYNCH1985
Lynch, D.M., Eliatamby, C.L. & Anderson, A.A. (1985) Pipothiazine palmitate in the management of aggressive mentally handicapped patients. *British Journal of Psychiatry, 146*, 525-529.

MALT1995
Malt, U.F., Nystad, R., Bache, T., *et al*. (1995) Effectiveness of zuclopenthixol compared with haloperidol in the treatment of behavioural disturbances in learning disabled patients. *British Journal of Psychiatry, 166*, 374-377.

MOFFATT1970
Moffatt, W.R., Siddiqui, A.R. & MacKay, D.N. (1970) The use of sulthiame with disturbed mentally subnormal patients. *British Journal of Psychiatry, 117*, 673-678.

OWLEY2010
Owley, T., Brune, C.W., Salt, J., *et al*. (2010) A pharmacogenetic study of escitalopram in autism spectrum disorders. *Autism Research, 3*, 1-7.

RUEDRICH1999
Ruedrich, S., Swales, T.P., Fossaceca, C., *et al*. (1999) Effect of divalproex sodium on aggression and self-injurious behaviour in adults with intellectual disability: a retrospective review. *Journal of Intellectual Disability Research, 43*, 105-111.

ROMEO2009
Romeo, R., Knapp, M., Tyrer, P., *et al*. (2009) The treatment of challenging behaviour in intellectual disabilities: cost-effectiveness analysis. *Journal of Intellectual Disability Research, 53*, 633-643.

RUEDRICH2008
Ruedrich, S.L., Swales, T.P., Rossvanes, C., *et al*. (2008) Atypical antipsychotic medication improves aggression, but not self-injurious behaviour, in adults with intellectual disabilities. *Journal of Intellectual Disability Research, 52*, 132-140.

RUGINO2002
Rugino, T.A. & Samsock, T.C. (2002) Levetiracetam in autistic children: an open-label study. *Journal of Developmental & Behavioral Pediatrics, 23*, 225-230.

THALAYASINGAM2004
Thalayasingam, S., Alexander, R.T. & Singh, I. (2004) The use of clozapine in adults with intellectual disability. *Journal of Intellectual Disability Research, 48*, 572-579.

TROOST2005
Troost, P.W., Lahuis, B.E., Steenhuis, M-P., *et al*. (2005) Long-term effects of risperidone in children with autism spectrum disorders: A placebo discontinuation study. *Journal of the American Academy of Child and Adolescent Psychiatry, 44*, 1137-1144 .

TYRER2009
Tyrer, P. O.-A. (2009) Neuroleptics in the treatment of aggressive challenging behaviour for people with intellectual disabilities: A randomised controlled trial (NACHBID). *Health Technology Assessment, 13*, 1-54.

VALICENTIMCDERM2006
Valicenti-McDermott, M. R. & Demp, H. (2006) Clinical effects and adverse reactions of off-label use of aripiprazole in children and adolescents with developmental disabilities. *Journal of Child and Adolescent Psychopharmacology, 16*, 549-560.

WASSERMAN2006
Wasserman, S., Iyengar, R., Chaplin, W.F., *et al*. (2006) Levetiracetam versus placebo in childhood and adolescent autism: a double-blind placebo-controlled study. *International Clinical Psychopharmacology, 21*, 363-367.

WEIR1968
Weir, T.W.H., Kernohan, G.A. & MacKay, D.N. (1968) The use of Pericyazine and chlorpromazine with disturbed mentally subnormal patients. *British Journal of Psychiatry, 114*, 111-112.

ZARCONE2001
Zarcone, J.R., Hellings, J.A., Crandall, K., *et al*. (2001) Effects of risperidone on aberrant behaviour of persons with developmental disabilities: I. a double-

blind crossover study using multiple measures. *American Journal on Mental Retardation, 106*, 525-538.

ORGANISATION AND DELIVERY OF CARE: SETTINGS FOR CARE

1.4.4 Characteristics of included studies

Study ID	BARLOW1991
Bibliographic reference	Barlow, J. & Kirby, N. (1991) Residential satisfaction of persons with an intellectual disability living in an institution or in the community. *Australia and New Zealand Journal of Developmental Disabilities, 17*, 7-23.
Methods	**Allocation:** Non-randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Residential versus community **Raters:** Self-report via interview with investigator **Country:** Australia
Participants	**Diagnosis:** LD (mild LD) **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 31 **Age:** 20-51 years (means: residential mean: 28.5 years; community mean: 32.8 years) **Sex:** Male: 16; Female: 15 **Ethnicity:** Not reported **IQ:** Not reported **Inclusion criteria:** Not reported
Interventions	1. Residential institution group (N=16). This residential institution was called Balyana and attempted to improve on traditional institutional models by providing individual rooms with bathrooms for each resident, low staff to resident ratios and relatively few restrictions. Leisure facilities included a swimming pool, tennis courts, an oval, games room, and a small auditorium. Residents completed training programs in personal hygiene, room care, and laundry, and in community living skills 2. Community group (N=15). All of the community group were living in the community without support services and all were renting except one who was buying a flat **Duration:** **Intervention:** Not applicable **Follow-up:** Average amount of time spent living at residential institution 6 months-8 years (mean: 3.5 years); those in the community had been resident there for 1 month-2 years (mean: 1 year)
Outcomes	The primary outcome was resident satisfaction as assessed via interview with the investigator which was based on the Satisfaction Qustionnaire of Seltzer and Seltzer's (1978) Community Adjustment Scale. Satisfaction subscales included: residential satisfaction; leisure satisfaction; work satisfaction;financial satisfaction; and interpersonal satisfaction. Data were extracted for residential satisfaction as this was the only outcome for which the authors found significant group differences.
Study Design	Observational (cohort study)

Source of funding	Not reported
Limitations	1. Group differences in duration of residency in each setting
Notes	• N=2 were removed from the residential institution group for the analysis due to inconsistent reporting for one participant and persistent acquiescence for the other participant. As a result N=14 for the residential institution group. • For the purposes of analysis the residential institution was taken as the experimental group

Study ID	BHAUMIK2009
Bibliographic reference	Bhaumik, S., Watson, J.M., Devapriam, J., *et al*. (2009) Aggressive challenging behaviour in adults with intellectual disability following community resettlement. *Journal of Intellectual Disability Research, 53*, 298-302.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Non-blind **Setting:** Residential to community **Raters:** Carer-report scale **Country:** UK
Participants	**Diagnosis:** LD **Coexisting conditions:** Many individuals also had co-existing health problems; 36 (73%) were incontinent, 2 (4%) had a hearing impairment; 17 (35%) had a visual impairment; 30 (61%) had mobility problems and 32 (65%) suffered from epilepsy **Qualifying Diagnostic Assessment:** Vineland Scale **N:** 49 **Age:** 31-96 years (means: Males: 50.8 years; Females: 49.3 years) **Sex:** Male: 36; Female: 13 **Ethnicity:** White N=49 **IQ:** Not reported - 34 (69%) had profound ID, 11 (22%) had severe ID, 3 (6%) had moderate ID, and 1 (2%) had mild ID **Inclusion criteria:** The adult residents who left a long-stay hospital in Leicestershire and were relocated to a number of community-based placements between 2004 and 2006
Interventions	1. Relocation from residential to community (N=49) **Duration:** **Intervention:** Not applicable **Follow-up:** 18 months
Outcomes	Primary outcome was aggressive challenging behaviour as measured by the Modified Overt Aggression Scale (MOAS)
Study Design	Observational (before-and-after)
Source of funding	Leicestershire Partnership NHS Trust and the Department of Health Policy Research Programme
Limitations	1. No control group 2. Efficacy data cannot be extracted 3. Median scores reported which may indicate skewed data
Notes	• Participants followed for 12 months after discharge but change from baseline results reported based on baseline (6 months before discharge) and 6 month (after discharge) comparison

Study ID	BOURAS1993
Bibliographic reference	Bouras, N., Kon, Y. & Drummond, C. (1993) Medical and psychiatric needs of adults with a mental handicap. *Journal of Intellectual Disability Research, 37*, 177-182.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Non-blind **Setting:** Residential to community **Raters:** Clinician-rated **Country:** UK
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** DSM III-R **N:** 71 **Age:** Range not reported (mean: 46.1 years) **Sex:** Male: 46; Female: 25 **Ethnicity:** Not reported **IQ:** Not reported (46% severe mental handicap; 24% moderate mental handicap; 30% mild mental handicap) **Inclusion criteria:** Not reported
Interventions	1. Mentally handicapped adults resettled from large institutions to community facilities including 'staffed houses' **Duration:** **Intervention:** Not applicable **Follow-up**: 1 year
Outcomes	Data were collected and reported on behaviour problems, utilization of medical and psychiatric services, staff opinion on behaviour disturbance, psychiatric diagnosis and medical input for physical illness, as measured by clinical assessment pre- and post-resettlement using the 'Assessment and Information Rating Profile' (Bouras & Drummond, 1992), by seeing the resident, interviewing a care worker and looking at case notes. However, data could only be extracted for behaviour problems.
Study Design	Observational (before-and-after study)
Source of funding	Not reported
Limitations	1. No control group 2. Efficacy data could not be extracted
Notes	

Study ID	CHOU2008
Bibliographic reference	Chou, Y-C., Lin, L-C., Pu, C-Y., *et al*. (2008) Outcomes and costs of residential services for adults with intellectual disabilities in Taiwan: a comparative evaluation. *Journal of Applied Research in Intellectual Disabilities, 21*, 114-125.
Methods	**Allocation:** Non-randomised **Matching:** Matched on resident's disability level, age and gender **Blindness:** Non-blind **Setting:** Residential-versus-community **Raters:** Self-report and scales rated by front line practitioners and residential managers (or administrators) **Country:** China
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 248 **Age:** Range not reported (means: small residential home mean: 28.6 years; group/community home mean: 30.5 years); institution mean: 29.5 years) **Sex:** Male: 177; Female: 71 **Ethnicity:** Not reported **IQ:** Not reported (majority moderate to severe LD) **Inclusion criteria:** Not reported
Interventions	1. Small residential group home (N=103) 2. Institution (N=76) Data was also reported for group/community home residents (N=69). However, that data is not extracted here as the authors statistical analysis (which controlled for group differences in adaptive/maladaptive behaviour) suggested that the largest group differences lay with the groups selected. **Duration:** **Intervention:** Not applicable **Follow-up:** Not reported
Outcomes	Primary outcomes included: quality of life as measured by the Quality of Life Questionnaire (QOLQ; Schalock & Keith, 1993); choice making as measured using the Residence Choice Assessment Scale (RCAS; Kearney et al. 1995); community inclusion as scored using the Use of Community Facilities Scale (UCFS) and measured the variety of community places and activities that the residents used and were engaged in; and family contact which was assessed by the frequency of face-to-face visits between the participants and his/her family members
Study Design	Observational (cross-sectional)
Source of funding	Department of Social Affairs, Ministry of Interior, Taiwan, China
Limitations	1. Significant differences between the groups in adaptive and maladaptive behaviour. However, this was controlled for in the authors' statistical analysis and significant differences remained
Notes	

Study ID	CHOU2011
Bibliographic reference	Chou, Y.C., Pu, C., Kröger, T., *et al*. (2011) Outcomes of a new residential scheme for adults with intellectual disabiliites in Taiwan: a 2-year follow-up. *Journal of Intellectual Disability Research, 55*, 823-831.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Non-blind **Setting:** Community **Raters:** Self-report **Country:** Taiwan
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Diagnoses of classification and level of disability were conducted by the health authorities, and the severity of the intellectual disability was categorised in accordance with the person's IQ score and social adaptation skills **N:** 49 at time 1; 29 at time 5 **Age:** Time 1: 19-57 years (mean; 27 years); Time 5: 21-59 years (mean: 30.7 years) **Sex:** Time 1: Male: 33; Female: 16. Time 5: Male: 24; Female: 5 **Ethnicity:** Not reported **IQ:** Not reported. Time 1: 33% severe/profound LD; Time 5: 31% severe/profound LD **Inclusion criteria:** Participants were new in homes (only been in new homes for 1-2 months)
Interventions	1. Time 1 - Residential scheme which involved individuals with LD moving from their family home or from institutions to small-scale residential homes (N=49). This scheme provided accomodation in ordinary housing in established residential areas and all were a few minutes' walk from the town/city centre. Each home was limited to six or fewer residents and was staffed by support services 24 hours a day. 2. Time 5 - Participants still living in these residential homes 2 years later (N=29). 20 residents had left and moved back to their families (N=14) or institutions (N=6). The authors report the results of a subgroup analysis which compares outcomes for participants moving from an institution with participants moving from family homes. However, this data could not be extracted as the sample size for analysis is too small for the end-point scores. **Duration:** **Intervention:** 2 years **Follow-up:** 2 years
Outcomes	The primary outcome was quality of life as measured by the Quality of Life Questionnaire (QoL-Q; Schalock & Keith, 1993). The level of family contact was also examined, although the outcome measure for this item was less clear.
Study Design	Obeservational (before-and-after)
Source of funding	Ministry of Interior of the Taiwan Government and National Science Council (NSC 95-2412-H-010-001-SSS)
Limitations	1. Lack of a control group

Notes	

Study ID	CULLEN1995
Bibliographic references	Cullen, C., Whoriskey, M., Mackenzie, K., *et al*. (1995) The effects of deinstitutionalization on adults with learning disabilities. *Journal of Intellectual Disability Research, 39*, 484-494.
Methods	**Allocation:** Non-randomised **Matching:** Matched on age (within 5 years), sex, length of institutionalisation, and adaptive behaviour score (overall ABS score) **Blindness:** Non-blind **Setting:** Residential to community **Raters:** Staff-report and self-report **Country:** UK
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 100 **Age:** 20-60 years (majority 31-50) **Sex:** Not reported **Ethnicity:** Not reported **IQ:** Not reported - more than N=70 moderately or severely LD **Inclusion criteria:** Not reported
Interventions	1. Participants moving from residential to community settings (N=50) 2. Participants staying in residential settings (N=50) Duration: Intervention: Not applicable Follow-up: 30 months
Outcomes	The primary outcomes were level of adaptive/maladaptive behaviour, community living skills, social skills and quality of life. Outcome measures included direct observation of a sample of community living skills (pedestrian skills, using a bus, ordering in a restaurant, and using public telephone), the Adaptive Behaviour Scale (ABS), staff- and self-report social skills, and behavioural observations of quality of life and quality of care, and interactions. Data were extracted for ABS overall score, quality of life, and staff-rated social skills.
Study Design	Observational (cohort)
Source of funding	Scottish Office Home and Health Department (Grant No. K/PPR/2/2/C798)
Limitations	1. No statistical correction made to control for multiple comparisons
Notes	

Study ID	DAGNAN1994A
Bibliographic reference	Dagnan, D., Howard, B. & Drewett, R.F. (1994a) A move from hospital to community-based homes for people with learning disabilities: activities outside the home. *Journal of Intellectual Disability Research, 38*, 567-576.
Methods	**Allocation:** Non-randomised **Matching:** Matched on sex and on the Wessex categories coding for ability to walk with help, visual disability, auditory disability, and speech ability. Age was matched within 5 years. **Blindness:** Non-blind **Setting:** Residential to community **Raters:** Self-report **Country:** UK
Participants	**Diagnosis:** LD **Coexisting conditions:** 4 participants were non-ambulant and 4 had some sensory impairments **Qualifying Diagnostic Assessment:** Not reported **N:** 36 **Age:** Range not reported (means: community mean: 42 years; institution mean: 41 years) **Sex:** Not reported **Ethnicity:** Not reported **IQ:** Not reported **Inclusion criteria:** Participants left the hospital between 31 July 1985 and 1 January 1988. They had lived in the hospital for at least 12 months prior to leaving, and short-stay residents were excluded from the study
Interventions	1. Participants moving from hospital to community-based homes (N=18) 2. Participants remaining resident at the hospital (N=18) **Duration:** **Intervention:** Not applicable **Follow-up:** 18 months
Outcomes	The primary outcome was activities outside the home as measured by diary self-report on the number and features of trips outside the home. Data were extracted for the number of trips outside the home
Study Design	Observational (cohort)
Source of funding	Northern Region Health Authority under the Care in the Community: Mental Handicap programme (grant MH/85/07)
Limitations	1. Small sample size
Notes	

Study ID	DAGNAN1998
Bibliographic reference	Dagnan, D., Ruddick, L. & Jones, J. (1998) A longitudinal study of the quality of life of older people with intellectual disability after leaving hospital. *Journal of Intellectual Disability Research, 42*, 112-121.
Methods	**Allocation:** Not applicable – no control group **Matching:** Not applicable – no control group **Blindness:** Non-blind **Setting:** Residential to community **Raters:** Self-report **Country:** UK
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 29 **Age:** 39-93 years (mean: 61 years) **Sex:** Not reported **Ethnicity:** Not reported **IQ:** Not reported **Inclusion criteria:** Not reported
Interventions	1. Hospital-to-community transition group (N=29) Duration: Intervention: Not applicable Follow-up: 53 months
Outcomes	Quality of life as measured by The Questionnaire on Quality of Life
Study Design	Observational (before-and-after)
Source of funding	Not reported
Limitations	1. Small sample size 2. No control group 3. Efficacy data cannot be extracted
Notes	• Participants followed for 53 months but statistical analysis extracted compares pre-move (5 months before the move) with 30 months (post-move) scores

Study ID	DONNELLY1996
Bibliographic reference	Donnelly, M., McGilloway, S., Mays, N., *et al*. (1996) One and two year outcomes for adults with learning disabilities discharged to the community. *British Journal of Psychiatry, 168*, 598-606.
Methods	**Allocation:** Not applicable – no control group **Matching:** Not applicable – no control group **Blindness:** Non-blind **Setting:** Residential to community **Raters:** Staff **Country:** UK
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 214 **Age:** Not reported **Sex:** Not reported **Ethnicity:** Not reported **IQ:** Not reported **Inclusion criteria:** Not reported
Interventions	1. Long-stay patients discharged from residential settings to live in community (N=214) **Duration:** **Intervention:** Not applicable **Follow-up:** 2 years
Outcomes	Primary outcomes were skills and behavioural problems as assessed by staff using standardized checklists. Data were extracted for challenging behaviour as measured by the Problems Questionnaire (PQ; Clifford, 1987) which assesses dangerousness, psychological impairment, management problems, socially unacceptable behaviour, and problems relating to attitudes and relationships
Study Design	Observational (before-and-after)
Source of funding	Not reported
Limitations	1. Participant characteristics very under-specified 2. No control group 3. Efficacy data cannot be extracted
Notes	• Participants were followed for 2 years, however, the statistical analysis extracted compared pre-discharge to 12-months post-discharge scores

Study ID	GASKELL1995
Bibliographic reference	Gaskell, G., Dockrell, J. & Rehman, H. (1995) Community care for people with challenging behaviours and mild learning disability: an evaluation of an assessment and treatment unit. *British Journal of Clinical Psychology, 34*, 383-395.
Methods	**Allocation:** Not applicable – no control group **Matching:** Not applicable – no control group **Blindness:** Non-blind **Setting:** Residential **Raters:** Staff report using standardized assessments **Country:** UK
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 34 **Age:** 18-46 years (mean: 29.2 years) **Sex:** Male: 24; Female: 10 **Ethnicity:** Not reported **IQ:** Not reported **Inclusion criteria:** Not reported
Interventions	1. Mental Impairment Evaluation and Treatment Service (MIETS) (N=34). This hospital-based unit seeks to prepare clients with a mild learning disability and challenging behaviours for resettlement in the community. 3 broad categories of interventions were used: medication, behavioural techniques (including anger management, graded exposure to stimuli and reinforcement), and skills training (including social skills, sex education, and daily living skills) **Duration:** **Intervention:** Not reported **Follow-up:** Progress of clients from pre-admission to 6-months post-discharge
Outcomes	Primary outcome was changes in behaviour over time as measured by the Vineland and the Adaptive Behaviour Scale Part II. Data were extracted for the ABS (II) violent behaviour domain
Study Design	Observational (before-and-after)
Source of funding	Grant from the Nuffield Foundation
Limitations	1. Small sample size and ABS data only available for half of the participants 2. No control group 3. Efficacy data cannot be extracted
Notes	

Study ID	HASSIOTIS2009
Bibliographic reference	Hassiotis, A., Robotham, D., Canagasabey, A., *et al*. (2009) Randomized, single-blind, controlled trial of a specialist behaviour therapy team for challenging behaviour in adults with intellectual disabilities. *American Journal of Psychiatry, 166*, 1278-1285.
Methods	**Allocation:** Randomised **Matching:** No matching **Blindness:** Single-blind **Setting:** Community **Raters:** Not reported **Country:** UK
Participants	**Diagnosis:** LD **Coexisting conditions:** Assumption that patients may well have co-morbid ill mental health **Qualifying Diagnostic Assessment:** Not reported **N:** 63 **Age:** Range not reported (means: experimental group mean: 39.6 years; control group mean: 41.3 years) **Sex:** Male: 37; Female:23 **Ethnicity:** White N=60 **IQ:** Not reported - 42 participants with mild/moderate and 21 with severe/profound intellectual disability **Inclusion criteria:** Service users were age 18 or over with any severity of intellectual disability. They were referred to the behaviour therapy team by members of the community intellectual disability teams, and needed to have behaviour severe enough to place the individual or others at risk, or placement breakdown was imminent despite other supports being offered. Service users in whom staff believed the challenging behaviour was the direct consequence of a mental disorder were excluded.
Interventions	1. Specialist behaviour therapy team (N=32). The team adopted a multidimensional model including applied behaviour analysis and positive behavioural support to address the problem behaviours without resorting to aversive strategies. Treatment involves a detailed functional analysis of the presenting problem and a comprehensive report is produced based on the functional analysis with recommendations for a multi-element intervention plan. Caregivers are expected to employ behavioural strategies and training is provided to enhance their skills 2. Standard treatment group (N=31). This service consists of five community intellectual disabilities teams, and the teams offer a range of interventions including pharmacotherapy, nursing, and enhancement of adaptive skills. **Duration:** **Intervention:** Mean of 9 contacts **Follow-up:** Mean of 6 months
Outcomes	Primary outcome was challenging behaviour as assessed by the Aberrant Behaviour Checklist (ABC). Outcomes of interest were the ABC irritability, hyperactivity, and lethargy subscales. Cost data was also reported but not extracted.
Study Design	RCT (narrative reporting)
Source of funding	South Essex Partnership University Foundation NHS Trust (grant

	code GRG3)
Limitations	1. Cannot extract data for efficacy as median values and interquartile ranges were reported. This may also imply that the data was skewed. We are thus restricted to analysing the results from this study via narrative review
Notes	

Study ID	HEMMING1983
Bibliographic reference	Hemming, H. (1983) The Swansea relocation study of mentally handicapped adults. *International Journal of Rehabilitation Research, 6*, 494-495.
Methods	**Allocation:** Non-randomised **Matching:** Matched on sex **Blindness:** Non-blind **Setting:** From institution to community **Raters:** Not reported **Country:** UK
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 50 at baseline; N: 32 at 5.5 year follow-up **Age:** Not reported (adults) **Sex:** Not reported **Ethnicity:** Not reported **IQ:** Not reported **Inclusion criteria:** Not reported
Interventions	1. Mentally hanidcapped adults who lived in large institutions and had been selected for transfer to two new small units (N=50 at time 1; N=32 at follow-up) **Duration:** **Intervention: Not applicable** **Follow-up:** 5.5 years
Outcomes	Primary outcome was adaptive behaviour (as measured by the AAMD's Adaptive Behaviour Scale (ABS))
Study Design	Observational (before-and-after)
Source of funding	Not reported
Limitations	1. Demographic data for control group (participants who remained in the institution) are reported. However, no between-group data analysis is reported. 2. Efficacy data could not be extracted
Notes	

Study ID	HOLBURN2004
Bibliographic reference	Holburn, S., Jacobson, J.W., Schwartz, A.A., *et al*. (2004) The willowbrook futures project: a longitudinal analysis of person-centered planning. *American Journal on Mental Retardation, 109*, 63-76.
Methods	**Allocation:** Non-randomised **Matching:** Matching was based on residence, age (±5 years), gender, intellectual level (e.g. mild to severe mental retardation), presence of psychiatric diagnosis (yes/no), and overall severity or magnitude of maladaptive behaviour **Blindness:** Non-blind **Setting:** Residential **Raters:** Objective measure **Country:** USA
Participants	**Diagnosis:** LD **Coexisting conditions:** 53% had psychiatric diagnosis **Qualifying Diagnostic Assessment:** Not reported **N:** 38 **Age:** 19-61 years (mean: 38.6 years) **Sex:** Male: 29; Female: 9 **Ethnicity:** Not reported **IQ:** Not reported (68.4% severe/profound mental retardation) **Inclusion criteria:** Participants were residing at four developmental centres in New York City that were operated by the New York State Office of Mental Retardation and Developmental Disabilities.
Interventions	1. Person-Centred Planning (PCP) (N=20). Planning occurred in four phases: introduction; development of a personal profile; creation of a vision of the future; and follow-along. The intervention was a slight modification of Mount's (1992, 1994) Personal Futures Planning. Person-centred planning meetings were held approximately once per month at the residence of the focus person until the first three phases were complete; thereafter, they occurred less frequently and the schedule depended on the intricacies of each team process. Team composition varied but often consisted of a facilitator, co-facilitator, service user, family member, behaviour specialist, service coordinator or social worker, bridge-builder, direct-support staff, and unit or house manager. 2. Traditional interdisciplinary service planning (ISP) (N=18). This group of matched peers lived in same developmental centres and received the type of individual habilitation planning typically provided to residents of large intermediate care facilities. The ISP teams typically met quarterly in the developmental centre. The teams were interdisciplinary, largely composed of professional staff (e.g. client coordinator, nurse, psychologist, speech therapist, teacher) who meet to discuss assessments, review progress toward service plan goals, and develop new written habilitative goals and methodologies to be pursued over the ensuing weeks and months. **Duration:** **Intervention:** Not reported **Follow-up:** 3 years
Outcomes	The primary outcome reported was The Person-Centred Planning Quality of Life Indicators (Holburn et al. 1996). However, data could not be extracted for this outcome. Data was also reported for the

	number of participants moving from institutional living to community living arrangements and this data was extracted
Study Design	Observational (parallel groups)
Source of funding	New York State Office of Mental Retardation and Developmental Disabilities (Albany, New York) and its Institute for Basic Research in Developmental Disabilities (Staten Island, New York)
Limitations	1. Bridge building funds only available to person-centred planning participants. However, only half of the experimental group who moved into the community used such resources which might suggest that this fund did not create an advantage favouring the person-centred planning group
Notes	

Study ID	KEARNEY1995
Bibliographic reference	Kearney, C.A., Durand, V.M. & Mindell, J.A. (1995) It's not where but how you live: choice and adaptive/maladaptive behavior in persons with severe handicaps. *Journal of Developmental and Physical Disabilities, 7*, 11-24.
Methods	**Allocation:** Non-randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Transitional developmental centre (between relocation from large developmental centre to smaller residential facilities) versus direct relocation to smaller community residences **Raters:** Staff-report based on standardized measures Country: USA
Participants	**Diagnosis:** LD **Coexisting conditions:** Secondary diagnoses included seizure disorders (21.1%), Down's Syndrome (7%) and others (8.8%, e.g. cerebral palsy) **Qualifying Diagnostic Assessment:** Not reported **N:** 57 **Age:** Range not reported (mean: 34.83 years) **Sex:** Male: 30; Female: 27 **Ethnicity:** Not reported **IQ:** Not reported – severe LD (3.5%) or profound LD (96.5%) **Inclusion criteria:** Not reported
Interventions	1. Transitional developmental centre before placement into intermediate care facilities (N=18) 2. Direct placement into intermediate care facility (N=39) **Duration:** **Intervention:** Not applicable **Follow-up:** One year
Outcomes	Primary outcome was levels of adaptive/maladaptive behaviour as measured by the Adaptive Behaviour Scale, Vineland Maladaptive Behaviour Scale, and the Resident Choice Assessment Scale. Data was extracted for the AAMD Adaptive Behaviour Scale
Study Design	Observational (cross-sectional)
Source of funding	Not reported
Limitations	1. Discrpancy in sample size between two groups
Notes	

Study ID	MCCONKEY2007
Bibliographic reference	McConkey, R., Abbott, S., Walsh, P. N., *et al*. (2007) Variations in the social inclusion of people with intellectual disabilities in supported living schemes and residential settings. *Journal of Intellectual Disability Research, 51*, 207–217.
Methods	**Allocation:** Non-randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Residential versus community **Raters:** Key-worker **Country:** UK & Ireland
Participants	**Diagnosis:** LD **Coexisting conditions:** 22.3% epilepsy **Qualifying Diagnostic Assessment:** Not reported **N:** 620 (N=241 for data extracted) **Age:** Range or mean not reported (61% aged under 50 years) **Sex:** Male: 331; Female: 289 **Ethnicity:** Not reported **IQ:** Not reported **Inclusion criteria:** Not reported
Interventions	1. Dispersed supported living (N=103) where person holds tenancy agreement for an ordinary house or apartment and support staff are provided according to assessed needs and they visit on a regular basis. The houses are dispersed among other properties 2. Residential homes (N=138) where an average of 19 people reside in a home Data were also reported for clustered supported living (N=132), small group homes (N=152), and campus settings (N=95). However, that data is not extracted here **Duration:** **Intervention:** Not applicable **Follow-up:** Not reported. 54% of dispersed supported living group and 64% of residential home group had been living there for more than 5 years
Outcomes	The primary outcome was social inclusion as measured by number of friends outside the home, number of neighbours in the area who know name, frequency of family contact, guests to stay in home, visitors to home, stayed away overnight, and use of community amenities (including cafe, pubs, shops, cinema, and places of worship). Data could only be extracted for number of community amenities used in past months
Study Design	Observational (cross-sectional)
Source of funding	Big Lottery Fund through a grant to Triangle Housing Association; and Department of Health and Children in the Republic of Ireland
Limitations	1. Limited data could be extracted from the study as a measure of variation (SD) was only reported for one scale item
Notes	

Study ID	MOLONY1990
Bibliographic reference	Molony, H. & Taplin, J.E. (1990) The deinstitutionalization of people with developmental disability under the Richmond program: I. changes in adaptive behavior. *Australia and New Zealand Journal of Developmental Disabilities, 16*, 149-159.
Methods	**Allocation:** Non-randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Community versus residential **Raters:** Staff report based on standardized assessments **Country:** Australia
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Raven's Coloured Progressive Matrices and Peabody Picture Vocabulary Test **N:** 57 (N=44 for data extracted) **Age:** 18-69 years (means: hostel to group home mean: 31.6 years; hospital to group home mean: 46.2 years; & stayed in hospital mean: 43.5 years) **Sex:** Male: 31; Female: 26 **Ethnicity:** Not reported **IQ:** Untestable-80 (medians: hostel to group home median: 45/50; hospital to group home median:54/45, & stayed in hospital median: could not be determined) **Inclusion criteria:** Not reported
Interventions	1. Participants who moved from a hospital ward to a group home (N=13) 2. Participants who stayed in the hospital over the entire period of study (N=31) Data were also reported for participants who had moved from a hostel to a group home (N=13). However, that data is not extracted here **Duration:** **Intervention:** 1 year **Follow-up:** 1 year
Outcomes	Primary outcome was adaptive behaviour as measured by the Vineland Adaptive Behaviour Scales
Study Design	Observational (cohort)
Source of funding	Research grant from the Prince Henry Hospital Centenary Research Fund
Limitations	1. Discrepancy in sample size between two groups
Notes	

Study ID	RAGHAVAN2009
Bibliographic reference	Raghavan, R., Newell, R., Waseem, F., *et al*. (2009) A randomized controlled trial of a specialist liaison worker model for young people with intellectual disabilities with challenging behaviour and mental health needs. *Journal of Applied Research in Intellectual Disabilities, 22*, 256-263.
Methods	**Allocation:** Randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Community **Raters:** Independent researcher carried out post-intervention assessments **Country:** UK
Participants	**Diagnosis:** LD **Coexisting conditions:** N=7 with challenging behaviour, N=1 with ASC, N=2 with Down's syndrome, N=1 with cerebral palsy, N=1 with Joubert's syndrome, and N=4 with epilepsy **Qualifying Diagnostic Assessment:** Not reported **N:** 26 **Age:** 13-25 years (means: experimental group mean: 17 years; control group mean: 19 years) **Sex:** Not reported **Ethnicity:** N=23 Pakistani families, and N=3 Bangladeshi families **IQ:** Not reported – N=10 with mild LD, N=8 with moderate LD, and N=8 with severe LD **Inclusion criteria:** Not reported
Interventions	1. Additional help of a liaison worker in accessing relevant services (N=12) 2. Normal service interventions (N=14) **Duration:** **Intervention:** 9 months **Follow-up:** 9 months
Outcomes	Primary outcome was the number of contacts with services as this best reflected the aim of the study to determine whether introduction of the specialist liaison service could enhance access to such services. Secondary outcomes included measures of challenging behaviours: Strengths and Difficulties Questionnaire (SDQ) and the Problem Behaviour Inventory (PBI) from the Behaviour Assessment Guide. Data was extracted for the number of contacts with services
Study Design	RCT
Source of funding	Foundation for People with Learning Disabilities and the Baily Thomas Charitable Fund
Limitations	1. Efficacy data could not be extracted 2. Small sample size
Notes	

Study ID	SCHALOCK1984
Bibliographic reference	Schalock, R.L., Gadwood, L.S. & Perry, P.B. (1984) Effects of different training environments on the acquisition of community living skills. *Applied Research in Mental Retardation, 5*, 425-438.
Methods	**Allocation:** Non-randomised **Matching:** Matched on gender, age, IQ, duration of prior community living skills training, skill level on the community living skills screening test, medication history, and the number of recorded negative behaviour incidents **Blindness:** Non-blind **Setting:** Current-living versus centre-based **Raters:** Independent assessment by 2 instructional staff prior to the study **Country:** USA
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** WAIS **N:** 20 **Age:** Range not reported (mean: 31 years) **Sex:** Male; 10; Female: 10 **Ethnicity:** Not reported **IQ:** Range not reported (mean: 51) **Inclusion criteria:** Not reported
Interventions	1. Community Living Skills (CLS) Training within current living environment (group home or staffed apartment) (N=10) 2. CLS Training within centre-based training environment (large group home adjacent to the adult developmental centre (N=10) **Duration:** **Intervention:** 1 year **Follow-up:** 1 year
Outcomes	Primary outcome was community living skill acquisition and skill maintenance. Data was extracted for average number of skills gained across community living skills behavioural domains
Study Design	Quasi-experimental (parallel groups)
Source of funding	Not reported
Limitations	1. Small sample size
Notes	

Study ID	SCHWARTZ2003
Bibliographic reference	Schwartz, C. (2003) Self-appraised lifestyle satisfaction of persons with intellectual disability: the impact of personal characteristics and community residential facilities. *Journal of Intellectual and Developmental Disability, 28*, 227-240.
Methods	**Allocation:** Non-randomised **Matching:** No matching **Blindness:** Non-blind **Setting:** Community **Raters:** Social workers **Country:** Israel
Participants	**Diagnosis:** LD **Coexisting conditions:** 57-61% had additional diagnosis **Qualifying Diagnostic Assessment:** Not reported **N:** 247 **Age:** 18-70 years (mean: 33.7 years) **Sex:** Male: 122; Female: 125 **Ethnicity:** Not reported **IQ:** Not reported. Mild LD N=131; moderate or above LD N=116 **Inclusion criteria:** To be eligible participants had to be verbally articulate, that is, without any severe hearing or expressive language problems, and to have been living in their current residence for at least a year at the time of the study
Interventions	1. Group home (GH) (N=147) 2. Semi-independent apartment (SIA) (N=57) Data was also reported for an independent apartment (IA) (N=43) group. However, that data is not extracted here **Duration:** **Intervention:** Not applicable **Follow-up:** 1 year
Outcomes	The primary outcome was resident satisfaction as measured by the Lifestyle satisfaction scale (LSS).
Study Design	Observarional (cross-sectional)
Source of funding	Not reported
Limitations	1. Differences in sample sizes across groups 2. Significant differences in demographic factors found between groups, e.g. group home residents oldest, and participants in independent apartments had the highest mean score for adaptive behaviour and the lowest mean score for challenging behaviour 3. No correction for pre-test group differences
Notes	

Study ID	SIAPERAS2006
Bibliographic reference	Siaperas, P. & Beadle-Brown, J. (2006) A case study of the use of a structured teaching approach in adults with autism in a residential home in Greece. *Autism, 10*, 330-343.
Methods	**Allocation:** Not applicable – no control group **Matching:** Not applicable – no control group **Blindness:** Non-blind **Setting:** Residential **Raters:** Staff report **Country:** Greece
Participants	**Diagnosis:** DSM-IV ASC **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Childhood Autism Rating Scale (CARS) **N:** 12 **Age:** 16-30 years (mean: 21.3 years) **Sex:** Male: 8; Female: 4 **Ethnicity:** Not reported **IQ:** All the participants also had LD, ranging from mild to severe **Inclusion criteria:** Residents of the residential home
Interventions	1. Treatment and Education of Autistic and related Communication Handicapped Children (TEACCH) approach (N=12), individualized but basic aspects include: Strong cooperation between staff & parents; different areas designated for each activity; daily visual schedules; strong work rules, e.g. 'first work then play'; transition area; structured activities; visual prompts **Duration:** **Intervention:** Not applicable **Follow-up:** 6 months
Outcomes	Primary outcome was adaptive behaviour as measured by staff-report questionnaire (based on Vineland Adaptive Behaviour Scales) and observation checklist
Study Design	Observational (before-and-after)
Source of funding	Not reported
Limitations	1. No control group 2. Efficacy data cannot be extracted 3. Small sample size
Notes	

Study ID	SPREAT1998
Bibliographic reference	Spreat, S., Conroy, J.W. & Rice, D.M. (1998) Improve quality in nursing homes or institute community placement? implementation of OBRA for individuals with mental retardation. *Research in Developmental Disabilities, 19*, 507-518.
Methods	**Allocation:** Non-randomised **Matching:** Matched on sex, year of birth (within 2 years), and scores on the sum of 4 academic items from the Behaviour Development Survey Scale Score (within 2 points) **Blindness:** Non-blind **Setting:** Residential to community **Raters:** Interviewers contracted by the state **Country:** USA
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 80 **Age:** Range not reported (mean: 40 years) **Sex:** Male: 18; Female: 22 **Ethnicity:** White N= 65, other N= 15 **IQ:** Not reported **Inclusion criteria:** Not reported
Interventions	1. Individuals moved from nursing homes to various community-based supported living arrangements (N=40) 2. Individuals who remained in the nursing home over the study period (N=40) *Duration:* *Intervention:* Not applicable *Follow-up:* 4 years
Outcomes	The primary outcomes were adaptive behaviour and challenging behaviour severity as measured by a modified version of the Behaviour Development Survey. Data could only be extracted for adaptive behaviour
Study Design	Observational (cohort)
Source of funding	Not reported
Limitations	
Notes	• Overlapping dataset with SPREAT2002 but reporting on different outcome meausures

Study ID	SPREAT2002
Bibliographic reference	Spreat, S. & Conroy, J.W. (2002) The impact of deinstitutionalization on family contact. *Research in Developmental Disabilities, 23*, 202-210.
Methods	**Allocation:** Not applicable - no control group **Matching:** Not applicable - no control group **Blindness:** Non-blind **Setting:** Residential to community **Raters:** Data collected by graduate students and staff from Sociology Department **Country:** USA
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported **Qualifying Diagnostic Assessment:** Not reported **N:** 177 **Age:** Range not reported (means: 26-27 years) **Sex:** Male: 106; Female: 71 **Ethnicity:** Cohort 1: 69.7% white, 21.2% black, 6.1% American Indian, 3% other; cohort 2: 85.7% white, 5.4% black, 8.9% American Indian; cohort 3: 73.7% white, 13.2% black, 13.2% American Indian; cohort 4: 72% white, 14% black, 12% American Indian, and 5% other **IQ:** Not reported – Majority have profound LD Inclusion criteria: Not reported
Interventions	1. Residents discharged from large public institution to small supported living arrangements (N=177; cohort 1 discharged in 1992, N=33; cohort 2 discharged in 1993, N=56; cohort 3 discharged in 1994, N=38; cohort 4 discharged in 1995, N=50) **Duration:** **Intervention:** Not applicable **Follow-up:** Over 5 years
Outcomes	Primary outcome was family contact as measured by the Developmental Disabilities Quality Assurance Questionnaire (DDQAQ)
Study Design	Observational (before-and-after)
Source of funding	Not reported
Limitations	1. No control group 2. Efficacy data cannot be extracted
Notes	• Overlapping dataset with SPREAT1998 but reporting on different outcomes

Study ID	WEHMEYER2001
Bibliographic reference	Wehmeyer, M.L. & Bolding, N. (2001) Enhanced self-determination of adults with intellectual disability as an outcome of moving to community-based work or living environments. *Journal of Intellectual Disability Research, 45*, 371-383.
Methods	**Allocation:** Not applicable – no control group **Matching:** Not applicable – no control group **Blindness:** Non-blind **Setting:** Residential to community **Raters:** Self-report **Country:** USA
Participants	**Diagnosis:** LD **Coexisting conditions:** Not reported. **Qualifying Diagnostic Assessment:** Not reported. **N:** 31 **Age:** 24-62 years (mean: 40.8 years) **Sex:** Male: 17; Female: 14 **Ethnicity:** Not reported **IQ:** Range not reported (mean: 60.25) **Inclusion criteria:** Participants needed to be able to complete self-report measures
Interventions	1. Moving from a more restrictive work or living environment to a less restrictive work or living environment (N=31; N=8 moved from more to less restrictive living environment, e.g. institution/nursing home to group home or community, or group home to community living; and N=21 moved from more to less restrictive work setting, e.g. day programme to sheltered workshop or competitive employment, or sheltered workshop to competitive employment) **Duration:** **Intervention:** Not applicable **Follow-up:** 1 year (assessment at 6 months prior to scheduled move and 6 months after transition)
Outcomes	The primary outcome was self-determination as measured by the Arcs's Self-Determination Scale: Adult Version and the Autonomous Functioning Checklist (AFC)
Study Design	Observational (before-and-after)
Source of funding	US Department of Education NIDRR grant (no. HH133G50178)
Limitations	1. No control group 2. Efficacy data cannot be extracted
Notes	

1.4.5 Characteristics of excluded studies

ARONOW2005

Reason for exclusion	Data could not be extracted

BEADLEBROWN2009

Reason for exclusion	Data could not be extracted

BIGBY2008

Reason for exclusion	Data could not be extracted

BURCHARD1991

Reason for exclusion	Data could not be extracted

CLARKE1992

Reason for exclusion	Mean age <15 years

CUMMINS1990

Reason for exclusion	Data could not be extracted

DAGNAN1994B

Reason for exclusion	Smaller but overlapping dataset with DAGNAN1994A

DAGNAN1995

Reason for exclusion	Data could not be extracted

DAGNAN1996

Reason for exclusion	Sample size is less than 10 per arm

DOCKRELL1995

Reason for exclusion	Sample size for analysis is less than 10 per arm

DONNELLY1997

Reason for exclusion	Sample size is less than 10 per arm

DONNER2010

Reason for exclusion	Co-morbid schizophrenia or mood disorder

EMERSON2000A

Reason for exclusion	Data could not be extracted

EMERSON2000B

Reason for exclusion	Data could not be extracted

EMERSON2001

Reason for exclusion	Data could not be extracted

EMERSON2004

Reason for exclusion	Paper concerned with description of care across settings

FELCE1985

Reason for exclusion	Sample size is less than 10 per arm

FELCE1992

Reason for exclusion	Sample size is less than 10 per arm

FERNANDO1997

Reason for exclusion	Co-morbid psychiatric disorders

FORRESTERJONES2006

Reason for exclusion	Data could not be extracted

GERBER2011

Reason for exclusion	Sample size for analysis is less than 10 per arm

GLISSON2010

Reason for exclusion	Co-morbid psychiatric disorders

GOODMAN2008

Reason for exclusion	Sample size is less than 10 per arm

GREGORY2001

Reason for exclusion	Data could not be extracted

HATTON1995

Reason for exclusion	Sample size for analysis is less than 10 per arm

HEAL1989

Reason for exclusion	Data could not be extracted

HELLER1998

Reason for exclusion	Paper concerned with predictive values of participant characteristics

JANSSEN1999

Reason for exclusion	Paper concerned with quality of service

JAWED1993

Reason for exclusion	Data could not be extracted

KON1997

Reason for exclusion	Data could not be extracted

KRAUSS2005

Reason for exclusion	Data could not be extracted

LEGAULT1992

Reason for exclusion	Data could not be extracted

LOVELL1999

Reason for exclusion	Mean age <15 years

LOWE1993

Reason for exclusion	Sample size is less than 10 per arm

LOWE1996

Reason for exclusion	Data could not be extracted

OLIVER2005

Reason for exclusion	Co-morbid psychiatric disorders

ONEILL1981

Reason for exclusion	Outcome not of interest (overall activity levels)

ONEILL1985

Reason for exclusion	Outcome not of interest (overall activity levels)

OWEN2008

Reason for exclusion	Sample size for analysis is less than 10 per arm

PAHL1987

Reason for exclusion	Not primary data

PANERAI2009

Reason for exclusion	Mean age <15 years

PERRY2003

Reason for exclusion	Paper concerned with quality of service

PIERCE1990

Reason for exclusion	Data could not be extracted

RAPLEY1998

Reason for exclusion	Data could not be extracted

READ2004

Reason for exclusion	Data could not be extracted

ROBERTSON2000

Reason for exclusion	Paper concerned with predictive values of participant characteristics

ROBERTSON2004

Reason for exclusion	Data could not be extracted

SCHWARTZ1995

Reason for exclusion	Data could not be extracted

SHERMAN1988

Reason for exclusion	Sample size is less than 10 per arm

SOURANDER1996

Reason for exclusion	Mean age <15 years

SPREAT1987

Reason for exclusion	Data could not be extracted

STANCLIFFE1998

Reason for exclusion	Data could not be extracted

STANCLIFFE2000

Reason for exclusion	Data could not be extracted

STRAUSS1998

Reason for exclusion	Data could not be extracted

TABERDOUGHTY2010

Reason for exclusion	Sample size is less than 10 per arm

TREFFERT1973

Reason for exclusion	Mean age <15 years

VALENTI2010

Reason for exclusion	Mean age <15 years for whole sample and data cannot be extracted for adolescent subgroup

VANBOURGONDIEN2003

Reason for exclusion	Sample size is less than 10 per arm

WALSH2001

Reason for exclusion	Data could not be extracted

YOUNG2004

Reason for exclusion	Sub-group analysis meant that data could not be extracted

YOUNG2006

Reason for exclusion	Data could not be extracted

1.4.6 References of excluded studies

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