# **Appendix P: Forest Plots**

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### A.1 Abbreviations

CSHQ	Children's Sleep Habits Questionnaire
EIBI	Early Intensive Behavioural Intervention
HHHR	hand-held health record
ICD-10	International Statistical Classification of Diseases and Related Health Problems (10 <sup>th</sup> edition)
PAS-ADD	Psychiatric Assessment Schedule for Adults with a Developmental Disability Checklist
ROC	Receiver operating characteristic
SSTP	Stepping Stones Triple-P
TAU	treatment as usual

# A.2 Risk markers associated with the development of behaviour that challenges

#### A.2.1 Auditory impairment

# Figure 1: Auditory impairment versus no auditory impairment as a risk factor for all aggression (physical, verbal and destructive)

	Auditoryimpai	rment	No impair	rment		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Lundqvist 2013	15	34	300	881	46.1%	1.53 [0.77, 3.05]	<b>+∎</b>
Cooper 2009	20	276	80	747	53.9%	0.65 [0.39, 1.09]	
Total (95% CI)		310		1628	100.0%	0.97 [0.42, 2.23]	•
Total events	35		380				
Heterogeneity: Tau² = Test for overall effect:			P = 0.05); I <sup>2</sup>	= 74%			0.05 0.2 1 5 20
		- /					No impairment Auditory impairment

#### Figure 2: Auditory impairment versus no auditory impairment as a risk factor for selfinjury

	Auditoryimpai	ment	No impair	rment		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% Cl
Richards 2012	5	6	69	142	10.6%	5.29 [0.60, 46.43]	<b>→</b>
Lundqvist 2013	12	34	270	881	40.5%	1.23 [0.60, 2.53]	
Cooper 2009	20	276	80	747	48.9%	0.65 [0.39, 1.09]	
Total (95% CI)		316		1770	100.0%	1.05 [0.49, 2.29]	-
Total events	37		419				
Heterogeneity: Tau <sup>2</sup> =	0.25; Chi <sup>2</sup> = 4.80,	df = 2 (F	<sup>o</sup> = 0.09); l <sup>2</sup>	! = 58%			
Test for overall effect:	thards 2012 5 6 69 142 10.6% 5.29 [0.60, 46.43] hdqvist 2013 12 34 270 881 40.5% 1.23 [0.60, 2.53] oper 2009 20 276 80 747 48.9% 0.65 [0.39, 1.09] tal (95% Cl) 316 1770 100.0% 1.05 [0.49, 2.29] tal events 37 419 terogeneity: Tau <sup>2</sup> = 0.25; Chi <sup>2</sup> = 4.80, df = 2 (P = 0.09); l <sup>2</sup> = 58% terogeneity: Tau <sup>2</sup> = 0.25; Chi <sup>2</sup> = 4.80, df = 2 (P = 0.09); l <sup>2</sup> = 58% to coverall effect: $7 = 0.13$ ( $P = 0.90$ )					No impairment Auditory impairment	

# Figure 3: Auditory impairment versus no auditory impairment as a risk factor for stereotypy

	Auditoryimpai	No impaiı	rment		Odds Ratio	Odds Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% Cl
Lundqvist 2013	16	34	362	881	100.0%	1.27 [0.64, 2.53]	
Total (95% CI)		34		881	100.0%	1.27 [0.64, 2.53]	
Total events	16		362				
Heterogeneity: Not ap	plicable						
Test for overall effect:	Z = 0.69 (P = 0.4	9)					0.05 0.2 1 5 20 No impairment Auditory impairment

#### A.2.2 Autism diagnosis

Figure 4: Autism diagnosis versus no autism diagnosis as a risk factor for all aggression (physical, verbal and destructive)

	Autisn	n	No auti	sm		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Cooper 2009	9	77	91	946	26.7%	1.24 [0.60, 2.58]	
Lundqvist 2013	69	143	246	772	73.3%	1.99 [1.39, 2.86]	
Total (95% CI)		220		1718	100.0%	1.76 [1.17, 2.65]	•
Total events	78		337				
Heterogeneity: Tau <sup>2</sup> = Test for overall effect:				P = 0.25	5); <b>I</b> ² = 23%	6	0.05 0.2 1 5 20 No autism Autism

### Figure 5: Autism diagnosis versus no autism diagnosis as a risk factor for physical aggression

	Autis	m	No auti	sm		Odds Ratio		Odds Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI		M-H, Random, 95% Cl	
2.4.1 Mixed setting									_
Davidson 1994	7	10	124	189	5.8%	1.22 [0.31, 4.89]			
Tyrer 2006	20	68	423	2994	27.1%	2.53 [1.49, 4.31]		<b>∎</b>	
Bhaumik 1997 Subtotal (95% CI)	318	1044 1122	159	1157 <b>4340</b>	57.4% <b>90.4%</b>	2.75 [2.22, 3.40] 2.68 [2.20, 3.25]			
Total events	345		706						
Heterogeneity: Tau <sup>2</sup> = Test for overall effect: 2				P = 0.51	l); l² = 0%				
2.4.2 Educational sett	ing								
Ando 1979a Subtotal (95% CI)	12	47 47	6	128 <b>128</b>	9.6% <b>9.6%</b>	6.97 [2.44, 19.91] 6.97 [2.44, 19.91]			
Total events	12		6						
Heterogeneity: Not app	olicable								
Test for overall effect:	Z = 3.63 (	P = 0.0	003)						
Total (95% CI)		1169		4468	100.0%	2.80 [1.98, 3.98]		•	
Total events	357		712						
Heterogeneity: Tau <sup>2</sup> =	0.04; Chi <sup>2</sup>	= 4.42	, df = 3 (F	P = 0.22	2); I² = 32%	н	0.05	0.2 1 5 20	
Test for overall effect: 2			/				0.00	No autism Autism	
Test for subgroup diffe	rences: C	hi² = 3.	09, df = 1	(P = 0	.08), I <sup>2</sup> = 67	7.7%			

## Figure 6: Autism diagnosis versus no autism diagnosis as a risk factor for destruction of property

	Autis	m	No auti	sm		Odds Ratio		Odds	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Rand	om, 95% C	l i
2.2.1 Educational set	ting									
Ando 1979a Subtotal (95% Cl)	16	47 47	5	128 128	43.0% 43.0%	12.70 [4.32, 37.34] 12.70 [4.32, 37.34]				
Total events	16		5							
Heterogeneity: Not ap	•									
Test for overall effect:	Z = 4.62 (	P < 0.0	0001)							
2.2.2 Mixed setting										
Bhaumik 1997 Subtotal (95% CI)	263	1044 <b>1044</b>	116	1157 <b>1157</b>	57.0% 57.0%	3.02 [2.38, 3.83] 3.02 [2.38, 3.83]			•	
Total events Heterogeneity: Not ap	263 plicable		116							
Test for overall effect:	•	P < 0.0	0001)							
Total (95% CI)		1091		1285	100.0%	5.60 [1.39, 22.56]				
Total events	279		121			• • •				
Heterogeneity: Tau <sup>2</sup> =		= 6.49		P = 0.01	). I2 = 850	6	H			
				- 0.0	1), 1 = 007	0	0.05	0.2	1 5	20
Test for overall effect:				(	o () 12 - 0	1.00/		No autism	Autism	
Test for subgroup diffe	erences: C	ni² = 6.	49, df = 1	(P = 0	.01), I <sup>2</sup> = 8	4.6%				

### Figure 7: Autism diagnosis versus no autism diagnosis as a risk factor for self-injury

	Autis	m	No aut	sm		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
2.5.1 Educational set	ting						
Ando 1979a Subtotal (95% Cl)	20	47 47	7	128 <b>128</b>	15.7% <b>15.7%</b>	12.80 [4.92, 33.32] 12.80 <b>[4.92, 33.32]</b>	
Total events	20		7				
Heterogeneity: Not ap	plicable						
Test for overall effect:	Z = 5.22 (	P < 0.0	0001)				
2.5.2 Mixed setting							
Bradley 2004	7	12	6	12	8.3%	1.40 [0.28, 7.02]	
Cooper 2009	9	77	91	946	19.8%	1.24 [0.60, 2.58]	
Lundqvist 2013	72	143	211	772	27.1%	2.70 [1.87, 3.88]	
Bhaumik 1997	282	1044	101	1157	29.0%	3.87 [3.03, 4.95]	
Subtotal (95% CI)		1276		2887	84.3%	2.49 [1.54, 4.04]	
Total events	370		409				
Heterogeneity: Tau <sup>2</sup> =	0.15; Chi2	<sup>2</sup> = 10.6	5, df = 3	(P = 0.0	01); l <sup>2</sup> = 72	2%	
Test for overall effect:	Z = 3.71 (	P = 0.0	002)				
Total (95% CI)		1323		3015	100.0%	3.11 [1.81, 5.35]	•
Total events	390		416				
Heterogeneity: Tau <sup>2</sup> =	0.25; Chi <sup>2</sup>	<sup>2</sup> = 18.5	0, df = 4	P = 0.0	0010); l <sup>2</sup> =	78%	
Test for overall effect:					,, .		0.05 0.2 1 5 20
Test for subgroup diffe			· ·	(P = 0)	003) l <sup>2</sup> =	88.8%	No autism Autism

Test for subgroup differences: Chi<sup>2</sup> = 8.96, df = 1 (P = 0.003), l<sup>2</sup> = 88.8\%

### A.2.3 Degree of learning disability

Figure 8: Mild/moderate learning disability versus severe/profound learning disability as a risk factor for all aggression (physical, verbal and destructive)

	Severe/Pro	Mild/Mod	derate		Odds Ratio	Odds Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% CI
Cooper 2009	57	377	43	646	49.1%	2.50 [1.64, 3.80]	
Lundqvist 2013	54	143	257	752	50.9%	1.17 [0.81, 1.69]	-
Total (95% CI)		520		1398	100.0%	1.70 [0.81, 3.57]	•
Total events	111		300				
Heterogeneity: Tau <sup>2</sup> = Test for overall effect:			1 (P = 0.0	08); I² =	86%		0.05 0.2 1 5 20 Mild/Moderate Severe/Profound

# Figure 9: Mild/moderate learning disability versus severe/profound learning disability as a risk factor for physical aggression

	Severe/Pro	found	Mild/Mo	derate		Odds Ratio	Odds	Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Rand	om, 95% Cl
4.5.1 Inpatient setting								
Ross 1972	1885	8654	731	2485	15.9%	0.67 [0.60, 0.74]	-	
Subtotal (95% CI)		8654		2485	15.9%	0.67 [0.60, 0.74]	•	
Total events	1885		731					
Heterogeneity: Not app	licable							
Test for overall effect: Z	z = 7.88 (P <	0.00001)	)					
4.5.2 Mixed setting								
Hardan 1997	13	22	40	72	9.0%	1.16 [0.44, 3.04]		•
Davidson 1994	49	70	82	129	12.1%	1.34 [0.72, 2.50]	-	<b>├</b> ∎──
Tyrer 2006	299	1647	127	1317	15.4%	2.08 [1.67, 2.59]		-
Crocker 2006	314	995	454	2165	15.7%	1.74 [1.47, 2.06]		-
Eyman 1977	899	2489	1229	4381	15.9%	1.45 [1.31, 1.61]		•
Jacobson 1982	2615	17847	899	12730	16.0%	2.26 [2.09, 2.45]		•
Subtotal (95% CI)		23070		20794	84.1%	1.76 [1.40, 2.22]		•
Total events	4189		2831					
Heterogeneity: Tau <sup>2</sup> = 0	0.06; Chi <sup>2</sup> = 4	17.73. df =	= 5 (P < 0.	00001):	<sup>2</sup> = 90%			
Test for overall effect: Z				,,				
Total (95% CI)		31724		23279	100.0%	1.45 [0.94, 2.25]		•
Total events	6074		3562			• • •		
Heterogeneity: Tau <sup>2</sup> = 0		364.28. df		0.00001):	l <sup>2</sup> = 98%		L	
Test for overall effect: Z			- (, ,				0.05 0.2	1 5 20
Test for subgroup differ	× •		df = 1 (P <	0 00001	) 12 = 98.3	3%	Mild/Moderate	Severe/Profound
reet ion cabgroup amer	chicco. On	07.02,0	(	0.00001	,,, 00.0			

# Figure 10: Mild/moderate learning disability versus severe/profound learning disability as a risk factor for verbal aggression

	Severe/Profound		Mild/Moderate		Odds Ratio		Odds Ratio		
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95%	6 CI	
Crocker 2006	293	995	896	2165	100.0%	0.59 [0.50, 0.69]			
Total (95% CI)		995		2165	100.0%	0.59 [0.50, 0.69]	•		
Total events	293		896						
Heterogeneity: Not ap Test for overall effect:	•	0.00001)	)				0.05 0.2 1 Mild/Moderate Severe	5 20 e/Profound	

#### Figure 11: Mild/moderate learning disability versus severe/profound learning disability as a risk factor for all challenging behaviour (physical aggression, self-injury, destructive behaviour and aberrant behaviour [measured by the Aberrant Behaviour Checklist])

	Severe/Pro	found	Mild/Mod	erate		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Holden 2006	51	218	40	604	57.8%	4.31 [2.75, 6.74]	
Myrbakk 2008	21	96	7	44	42.2%	1.48 [0.58, 3.80]	
Total (95% Cl)		314		648	100.0%	2.74 [0.97, 7.74]	•
Total events	72		47				
Heterogeneity: Tau <sup>2</sup> =				0.01 0.1 1 10 100			
Test for overall effect:	Z = 1.91 (P =	0.06)					Mild/Moderate Severe/Profound

## Figure 12: Mild/moderate learning disability versus severe/profound learning disability as a risk factor for destruction of property

	Severe/Profound Mild/Mod		lerate		Odds Ratio	Odds Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% CI
Crocker 2006	259	995	496	2165	100.0%	1.18 [1.00, 1.41]	
Total (95% CI)		995		2165	100.0%	1.18 [1.00, 1.41]	•
Total events	259		496				
Heterogeneity: Not ap Test for overall effect:		0.06)					0.05 0.2 1 5 20 Mild/Moderate Severe/Profound

## Figure 13: Mild/moderate learning disability versus severe/profound learning disability as a risk factor for inappropriate sexual behaviour

	Severe/Profound		Mild/Mod	lerate		Odds Ratio	Odds Ratio		
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Rand	lom, 95% Cl	
Crocker 2006	99	995	211	2165	100.0%	1.02 [0.80, 1.32]			
Total (95% CI)		995		2165	100.0%	1.02 [0.80, 1.32]		•	
Total events	99		211						
Heterogeneity: Not ap Test for overall effect:	·	0.86)					0.05 0.2 Mild/Moderate	1 5 Severe/Profe	20 ound

# Figure 14: Mild/moderate learning disability versus severe/profound learning disability as a risk factor for self-injury

	Severe/Pro	ofound	Mild/Mo	derate		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
4.6.1 Inpatient setting	I						
Ballinger 1971	68	289	25	337	8.1%	3.84 [2.35, 6.27]	
Maisto 1978	174	994	8	306	6.9%	7.90 [3.84, 16.25]	
Ross 1972	2268	8654	410	2485	9.4%	1.80 [1.60, 2.02]	
Schroeder 1978	194	995	14	155	7.7%	2.44 [1.38, 4.32]	
Subtotal (95% CI)		10932		3283	32.1%	3.21 [1.73, 5.95]	
Total events	2704		457				
Heterogeneity: Tau <sup>2</sup> =	0.33; Chi <sup>2</sup> =	24.56, df =	= 3 (P < 0	.0001); l <sup>2</sup>	= 88%		
Test for overall effect:	Z = 3.70 (P =	0.0002)					
4.6.2 Mixed settings							
Cooper 2009	57	377	43	646	8.4%	2.50 [1.64, 3.80]	
Crocker 2006	386	995	383	2165	9.3%	2.95 [2.49, 3.49]	
Eyman 1977	725	2686	321	4184	9.4%	4.45 [3.86, 5.13]	-
Hardan 1997	17	22	27	72	5.0%	5.67 [1.88, 17.12]	—
Jacobson 1982	2315	17817	386	12730	9.4%	4.78 [4.28, 5.33]	•
Kebbon 1986	1044	11812	154	16746	9.3%	10.45 [8.80, 12.39]	+
Lundqvist 2013	82	143	196	752	8.7%	3.81 [2.64, 5.52]	
Rojahn 1986	254	293	177	233	8.3%	2.06 [1.31, 3.24]	
Subtotal (95% CI)		34145		37528	<b>67.9%</b>	4.06 [2.88, 5.71]	•
Total events	4880		1687				
Heterogeneity: Tau <sup>2</sup> =	0.21; Chi <sup>2</sup> =	139.08, df	= 7 (P <	0.00001)	<sup>2</sup> = 95%		
Test for overall effect:	Z = 8.00 (P <	: 0.00001)	)	,			
Total (95% CI)		45077		40811	100.0%	3.75 [2.62, 5.38]	•
Total events	7584		2144				-
Heterogeneity: Tau <sup>2</sup> =	0.35: Chi <sup>2</sup> =	343.80. df	= 11 (P <	0.00001	):   <sup>2</sup> = 97%	6	
Test for overall effect:			× •				0.05 0.2 1 5 20
Test for subgroup diffe				0.52),  ² =	= 0%		Mild/Moderate Severe/Profoun

# Figure 15: Mild/moderate learning disability versus severe/profound learning disability as a risk factor for stereotypy

	Severe/Pro	found	Mild/Mo	derate		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Berkson 1985	11	69	19	184	23.8%	1.65 [0.74, 3.67]	+
Lundqvist 2013	103	143	218	752	25.1%	6.31 [4.24, 9.39]	
Jacobson 1982	1571	3198	317	12730	25.5%	37.81 [33.16, 43.11]	· · · · · · · · · · · · · · · · · · ·
Eyman 1977	1055	2689	599	4181	25.5%	3.86 [3.44, 4.34]	· · · ·
Total (95% CI)		6099		17847	100.0%	6.38 [1.42, 28.65]	
Total events	2740		1153				
Heterogeneity: Tau <sup>2</sup> =	2.30; Chi <sup>2</sup> = 6	77.56, dt	f = 3 (P < (	0.00001);	; l <sup>2</sup> = 100%	6	
Test for overall effect:			,	,			0.05 0.2 1 5 20 Mild/Moderate Severe/Profound

### A.2.4 Expressive communication

# Figure 16: Expressive communication difficulties versus no expressive communication difficulties as a risk factor for all aggression (physical, verbal and destructive)

	Communication	n needs	No communicatio	n needs	Odds Ratio		Odds Ratio	
Study or Subgroup	Events Total		Events	Events Total		M-H, Random, 95% Cl	M-H, Random, 95% Cl	
Cooper 2009	56	480	44	541	43.3%	1.49 [0.98, 2.26]	∣ ┣᠊▇─	
Lundqvist 2013	59	146	256	769	56.7%	1.36 [0.95, 1.95]		
Total (95% CI)		626		1310	100.0%	1.41 [1.08, 1.86]	•	
Total events	115		300					
Heterogeneity: Tau <sup>2</sup> =	= 0.00; Chi <sup>2</sup> = 0.11,	df = 1 (P =	= 0.74); l² = 0%				0.05 0.2 1 5	
Test for overall effect:	: Z = 2.49 (P = 0.01	)					No comm. needs Comm. needs	

# Figure 17: Expressive communication difficulties versus no expressive communication difficulties as a risk factor for physical aggression

	Communication	needs	No communication n	eeds		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
5.2.1 Adults							
Bott 1997	250	668	784	2994	53.3%	1.69 [1.41, 2.01]	
Subtotal (95% CI)		668		2994	53.3%	1.69 [1.41, 2.01]	◆
Total events	250		784				
Heterogeneity: Not app	olicable						
Test for overall effect:	Z = 5.80 (P < 0.00	001)					
5.2.2 Mixed population	n						
McLean 1996	2	45	52	166	46.7%	0.10 [0.02, 0.44]	
Subtotal (95% CI)		45		166	<b>46.7%</b>	0.10 [0.02, 0.44]	
Total events	2		52				
Heterogeneity: Not app	olicable						
Test for overall effect:	Z = 3.08 (P = 0.00)	2)					
Total (95% CI)		713		3160	100.0%	0.46 [0.03, 7.43]	
Total events	252		836				
Heterogeneity: Tau <sup>2</sup> =	3.80; Chi <sup>2</sup> = 14.58,	df = 1 (P	= 0.0001); l <sup>2</sup> = 93%				
Test for overall effect:	Z = 0.55 (P = 0.58	)					0.05 0.2 1 5 No comm. needs Comm. need
Test for subgroup diffe	rences: Chi² = 14.	07, df = 1	(P = 0.0002), I <sup>2</sup> = 92.9%	6			No comm. needs Comm. need

# Figure 18: Expressive communication difficulties versus no expressive communication difficulties as a risk factor for self-injury

	Communication	needs	No comm. I	needs		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% CI
5.3.1 Educational sett	ing						
Ando 1979b	4	29	3	99	5.9%	5.12 [1.08, 24.37]	
Shodell 1968	18	38	4	21	7.5%	3.83 [1.08, 13.51]	
Subtotal (95% CI)		67		120	13.5%	4.29 [1.61, 11.45]	
Total events	22		7				
Heterogeneity: Tau <sup>2</sup> =	0.00; Chi² = 0.08, c	lf = 1 (P =	0.77); l <sup>2</sup> = 0 <sup>9</sup>	%			
Test for overall effect: 2	Z = 2.91 (P = 0.004	•)					
5.3.2 Inpatient setting							
Schroeder 1978	146	334	62	819	14.1%	9.48 [6.77, 13.29]	
Subtotal (95% CI)		334		819	14.1%	9.48 [6.77, 13.29]	•
Total events	146		62				
Heterogeneity: Not app	olicable						
Test for overall effect:	Z = 13.07 (P < 0.00	0001)					
5.3.3 Mixed settings							
Richards 2012	14	18	59	129	8.1%	4.15 [1.30, 13.30]	
McLean 1996	6	45	23	166	9.5%	0.96 [0.36, 2.51]	
Baghdadli 2003	71	114	38	92	12.6%	2.35 [1.34, 4.12]	— <b>-</b>
Cooper 2009	56	480	44	541	13.6%	1.49 [0.98, 2.26]	<b>⊢</b> ∎
Lundqvist 2013	78	146	205	769	13.9%	3.16 [2.20, 4.53]	
Bott 1997	173	668	383	2994		2.38 [1.94, 2.92]	1 🛨
Subtotal (95% CI)		1471		4691	72.5%	2.22 [1.66, 2.97]	•
Total events	398		752				
Heterogeneity: Tau <sup>2</sup> =			= 0.04); l <sup>2</sup> = {	56%			
Test for overall effect:	Z = 5.40 (P < 0.000	001)					
Total (95% CI)		1872		5630	100.0%	2.93 [1.80, 4.78]	•
Total events	566		821				
Heterogeneity: Tau <sup>2</sup> =			< 0.00001); l	² <b>= 88</b> %			0.05 0.2 1 5 20
Test for overall effect: 2	<b>`</b>	/					No comm. needs Comm. needs
Test for subaroup diffe	rences: Chi <sup>2</sup> = 40.9	1. df = 2 (	P < 0.00001	). I <sup>2</sup> = 95.	.1%		

## Figure 19: Expressive communication difficulties versus no expressive communication difficulties as a risk factor for stereotypy

	Communication	n needs	No communicatio	n needs	Odds Ratio		Odds Ratio		
Study or Subgroup	Events Total		Events Total		Weight M-H, Random, 95% C		M-H, Random, 95% CI		
Lundqvist 2013	88	146	290	769	100.0%	2.51 [1.74, 3.60]			
Total (95% CI)		146		769	100.0%	2.51 [1.74, 3.60]		•	
Total events	88		290						
Heterogeneity: Not ap	plicable						0.05 0.2	1 5	
Test for overall effect:	Z = 4.97 (P < 0.00	001)					0.05 0.2 No comm. needs		

#### A.2.5 Receptive communication

# Figure 20: Receptive communication difficulties versus no receptive communication difficulties as a risk factor for self-injury

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### A.2.6 Gender

# Figure 21: Male gender versus female gender as a risk factor for all aggression (physical, verbal and destructive)

	Male	•	Fema	le		Odds Ratio	Odds Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl	
7.1.1 Mixed								
Cooper 2009	42	562	58	461	28.4%	0.56 [0.37, 0.85]		
Lundqvist 2013	154	504	161	411	66.0%	0.68 [0.52, 0.90]		
Subtotal (95% CI)		1066		872	94.4%	0.64 [0.51, 0.81]	◆	
Total events	196		219					
Heterogeneity: Tau <sup>2</sup> = (	0.00; Chi <sup>2</sup>	= 0.60	, df = 1 (F	9 = 0.44	); I² = 0%			
Test for overall effect: 2	Z = 3.76 (	P = 0.0	002)					
7.1.2 Inpatient setting								
Tenneij 2009	42	82	18	26	5.6%	0.47 [0.18, 1.19]	<b>-</b> _	
Subtotal (95% CI)		82		26	5.6%	0.47 [0.18, 1.19]		
Total events	42		18					
Heterogeneity: Not app	licable							
Test for overall effect: 2	Z = 1.59 (	P = 0.1	1)					
Total (95% CI)		1148		898	100.0%	0.63 [0.51, 0.79]	◆	
Total events	238		237					
Heterogeneity: Tau² = (	0.00; Chi <sup>2</sup>	= 1.02	, df = 2 (F	9 = 0.60	); l <sup>2</sup> = 0%		0.05 0.2 1 5 2	Ļ
Test for overall effect: 2	z = 4.03 (	P < 0.0	001)			0.05 0.2 1 5 2 Female Male	U	
Test for subgroup differ	rences: C	hi² = 0.4	43, df = 1	(P = 0	.51), I² = 09	%		

#### Figure 22: Male gender versus female gender as a risk factor for physical aggression

				Odds Ratio	Odds Ratio
Study or Subgroup	log[Odds Ratio]	SE	Weight	IV, Random, 95% CI	IV, Random, 95% Cl
7.5.1 Adults					
Crocker 2006	0.0008	0.083	29.5%	1.00 [0.85, 1.18]	+
Crocker 2013	0.3257	0.2494	15.6%	1.38 [0.85, 2.26]	+
Davidson 1994	0.751	0.2985	12.7%	2.12 [1.18, 3.80]	
Tyrer 2006	0.3973	0.107	27.5%	1.49 [1.21, 1.83]	-
Subtotal (95% CI)			85.3%	1.36 [1.00, 1.85]	•
Heterogeneity: Tau <sup>2</sup> =	0.07; Chi <sup>2</sup> = 12.77,	df = 3 (P	= 0.005);	l <sup>2</sup> = 77%	
Test for overall effect: 2	Z = 1.96 (P = 0.05)				
7.5.2 C & YP					
Quine 1986	0.3775	0.2635	14.7%	1.46 [0.87, 2.44]	+
Subtotal (95% CI)			14.7%	1.46 [0.87, 2.44]	◆
Heterogeneity: Not app	olicable				
Test for overall effect: 2	Z = 1.43 (P = 0.15)				
Total (95% CI)			100.0%	1.37 [1.05, 1.78]	◆
Heterogeneity: Tau <sup>2</sup> =	0.06; Chi <sup>2</sup> = 13.27,	df = 4 (P	= 0.01); I	<sup>2</sup> = 70%	
Test for overall effect: 2	Z = 2.30 (P = 0.02)				
Test for subgroup diffe	rences: Chi <sup>2</sup> = 0.05	, df = 1 (	P = 0.82),	l <sup>2</sup> = 0%	
Tyrer 2006 Subtotal (95% CI) Heterogeneity: Tau <sup>2</sup> = 1 Test for overall effect: 2 7.5.2 C & YP Quine 1986 Subtotal (95% CI) Heterogeneity: Not app Test for overall effect: 2 Total (95% CI) Heterogeneity: Tau <sup>2</sup> = 1 Test for overall effect: 2	0.3973 $0.07; Chi^2 = 12.77,$ Z = 1.96 (P = 0.05) 0.3775 blicable Z = 1.43 (P = 0.15) $0.06; Chi^2 = 13.27,$ Z = 2.30 (P = 0.02)	0.107 df = 3 (P 0.2635 df = 4 (P	27.5% <b>85.3%</b> = 0.005); 14.7% <b>14.7%</b> <b>100.0%</b> = 0.01); I	1.49 [1.21, 1.83] <b>1.36 [1.00, 1.85]</b>   <sup>2</sup> = 77% 1.46 [0.87, 2.44] <b>1.46 [0.87, 2.44]</b> <b>1.37 [1.05, 1.78]</b> <sup>2</sup> = 70%	0.05 0.2 1 5 20 Female Male

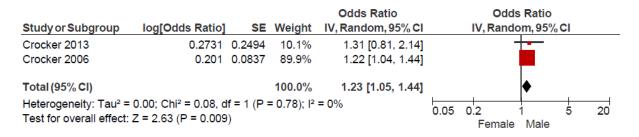
#### Figure 23: Male gender versus female gender as a risk factor for verbal aggression

Study or Subgroup	log[Odds Ratio]	SE	Weight	Odds Ratio IV, Random, 95% CI	IV	Odds Rat Random, 9		
Crocker 2006	-0.0305	0.0734	77.1%	0.97 [0.84, 1.12]				
Crocker 2013	-0.437	0.3083	22.9%	0.65 [0.35, 1.18]				
Total (95% CI)			100.0%	0.88 [0.63, 1.24]		•		
Heterogeneity: Tau <sup>2</sup> = Test for overall effect:		f = 1 (P =	= 0.20); I <sup>2</sup>	= 39%	0.05 0.2 F	emale Mal	5 e	20

# Figure 24: Male gender versus female gender as a risk factor for all challenging behaviour (aggression, self-injury, stereotypy and property destruction)

	Male	s	Femal	es		Odds Ratio	Odds Ratio				
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Random, 95% (			
Myrbakk 2008	15	73	13	67	22.7%	1.07 [0.47, 2.46]					
Holden 2006	56	446	34	370	77.3%	1.42 [0.90, 2.23]		+■-			
Total (95% CI)		519		437	100.0%	1.33 [0.90, 1.98]		•			
Total events	71		47								
Heterogeneity: Tau <sup>2</sup> = Test for overall effect:				P = 0.56	6); I <sup>2</sup> = 0%		0.05	0.2 1 5 Females Males	5 20		

# Figure 25: Male gender versus female gender as a risk factor for destruction of property



### Figure 26: Male gender versus female gender as a risk factor for inappropriate sexual behaviour

	Male	S	Femal	es		Odds Ratio		Odds	Ratio		
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Rand	om, 95%	CI	
Crocker 2006	194	1633	116	1527	100.0%	1.64 [1.29, 2.09]					
Total (95% CI)		1633		1527	100.0%	1.64 [1.29, 2.09]			•		
Total events	194		116								
Heterogeneity: Not ap Test for overall effect:	•	P < 0.0	001)				0.05	0.2 Females	1 Males	5	20

### Figure 27: Male gender versus female gender as a risk factor for self-injury (by setting)

	Males	5	Femal	es		Odds Ratio	Odds Ratio
Study or Subgroup	Events				Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
7.6.1 Mixed settings						, ,	
Richards 2012	65	131	9	17	2.2%	0.88 [0.32, 2.41]	
Quine 1986	32	245	15	154	4.4%	1.39 [0.73, 2.67]	+
Rojahn 1986	222	279	209	250	7.1%	0.76 [0.49, 1.19]	+
Cooper 2009	42	562	58	461	7.6%	0.56 [0.37, 0.85]	
Lundqvist 2013	152	504	131	411	10.7%	0.92 [0.70, 1.22]	-
Crocker 2006	366	1633	405	1527	13.7%	0.80 [0.68, 0.94]	-
Subtotal (95% CI)		3354		2820	45.6%	0.81 [0.69, 0.96]	◆
Total events	879		827				
Heterogeneity: Tau <sup>2</sup> =	0.01; Chi² :	<b>= 6</b> .57,	df = 5 (P :	= 0.25);	l² = 24%		
Test for overall effect: 2	Z = 2.39 (P	= 0.02	)				
7.6.2 Inpatient setting							
Ballinger 1971	46	343	47	283	7.2%	0.78 [0.50, 1.21]	
Maisto 1978	81	725	101	575	9.8%	0.59 [0.43, 0.81]	
Schroeder 1978	109	517	99	632	10.2%	1.44 [1.06, 1.94]	
Maurice 1982	223	1732	180	1529	12.5%	1.11 [0.90, 1.37]	•••
Griffin 1986	761	6664	581	5227	14.7%	1.03 [0.92, 1.16]	
Subtotal (95% CI)		9981		8246	54.4%	0.97 [0.76, 1.23]	•
Total events	1220		1008				
Heterogeneity: Tau <sup>2</sup> =	0.05; Chi² :	= 18.62	, df = 4 (P	9 = 0.00	09); l <sup>2</sup> = 799	%	
Test for overall effect:	Z = 0.27 (P	= 0.79	)				
Total (95% CI)		13335		11066	100.0%	0.90 [0.77, 1.05]	•
Total events	2099		1835				
Heterogeneity: Tau <sup>2</sup> =				P = 0.0	002); l² = 70	0%	0.05 0.2 1 5 20
Test for overall effect:			,				Females Males
Test for subgroup diffe	rences: Ch	i² = 1.3	6, df = 1 (	P = 0.24	4), I <sup>2</sup> = 26.7	%	

Challenging behaviour and learning disabilities

# Figure 28: Male gender versus female gender as a risk factor for self-injury (by population)

	Male	s	Fema	les		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% Cl
7.7.1 Mixed							
Richards 2012	65	131	9	17	2.2%	0.88 [0.32, 2.41]	
Rojahn 1986	222	279	209	250	7.1%	0.76 [0.49, 1.19]	
Maisto 1978	81	725	101	575	9.8%	0.59 [0.43, 0.81]	
Schroeder 1978	109	517	99	632	10.2%	1.44 [1.06, 1.94]	
Griffin 1986	761	6664	581	5227	14.7%	1.03 [0.92, 1.16]	
Subtotal (95% CI)		8316		6701	44.0%	0.92 [0.68, 1.25]	◆
Total events	1238		999				
Heterogeneity: Tau <sup>2</sup> =	0.08; Chi <sup>2</sup>	= 18.07	, df = 4 (F	P = 0.00	1); l² = 78%	5	
Test for overall effect:	Z = 0.55 (F	P = 0.58	)				
7.7.2 Adults							
Ballinger 1971	46	343	47	283	7.2%	0.78 [0.50, 1.21]	+
Cooper 2009	42	562	58	461	7.6%	0.56 [0.37, 0.85]	
Lundqvist 2013	152	504	131	411	10.7%	0.92 [0.70, 1.22]	-+
Maurice 1982	223	1732	180	1529	12.5%	1.11 [0.90, 1.37]	- <b>-</b> -
Crocker 2006	366	1633	405	1527	13.7%	0.80 [0.68, 0.94]	-
Subtotal (95% CI)		4774		4211	51.6%	0.85 [0.69, 1.04]	•
Total events	829		821				
Heterogeneity: Tau <sup>2</sup> =	0.03; Chi <sup>2</sup>	= 10.75	, df = 4 (F	P = 0.03	); l <sup>2</sup> = 63%		
Test for overall effect:	Z = 1.62 (F	P = 0.11	)				
7.7.3 C & YP							
Quine 1986	32	245	15	154	4.4%	1.39 [0.73, 2.67]	+
Subtotal (95% CI)		245		154	4.4%	1.39 [0.73, 2.67]	
Total events	32		15				
Heterogeneity: Not ap	plicable						
Test for overall effect:	Z = 1.00 (F	P = 0.32	)				
Total (95% CI)		13335		11066	100.0%	0.90 [0.77, 1.05]	•
Total events	2099		1835				
Heterogeneity: Tau <sup>2</sup> =	0.04; Chi <sup>2</sup>	= 33.46	, df = 10 (	(P = 0.0	002); l <sup>2</sup> = 7	0%	
Test for overall effect:					,.		0.05 0.2 1 5 20 Females Males

#### Figure 29: Male gender versus female gender as a risk factor for stereotypy

	Male	s	Femal	es		Risk Ratio		Risk	Ratio		
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Rand	om,95%		
Lundqvist 2013	209	504	169	411	100.0%	1.01 [0.86, 1.18]					
Total (95% CI)		504		411	100.0%	1.01 [0.86, 1.18]		•			
Total events	209		169								
Heterogeneity: Not ap Test for overall effect:		P = 0.9	2)				0.05	0.2 Female	1 Male	5	20

#### A.2.7 Mental health needs

### Figure 30: Mental health needs versus no mental health needs as a risk factor for all aggression (physical, verbal and destructive)

	Mental health	Mental health needs		No mental health needs		Odds Ratio		Odds Ratio		
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Rand	lom, 95% Cl		
Cooper 2009	7	39	93	984	27.3%	2.10 [0.90, 4.88]				
Lundqvist 2013	31	62	284	853	72.7%	2.00 [1.19, 3.36]				
Total (95% CI)		101		1837	100.0%	2.03 [1.30, 3.15]		•		
Total events	38		377							
Heterogeneity: Tau <sup>2</sup> =	= 0.00; Chi <sup>2</sup> = 0.0	1, df = 1 (	P = 0.93); I <sup>2</sup> = 0%				0.05 0.2	<del>   </del> 1 5	20	
Test for overall effect:	Z = 3.14 (P = 0.	002)					No MH needs			

# Figure 31: Mental health needs versus no mental health needs as a risk factor for physical aggression

Official and other states			No MH needs		14/-1	Odds Ratio	Odds Ratio
Study or Subgroup	log[Odds Ratio]	SE	Total	Iotai	Weight	IV, Fixed, 95% CI	IV, Fixed, 95% CI
Crocker 2013	0.0284	0.0193	16	280	85.5%	1.03 [0.99, 1.07]	
Jacobson 1982	0.7134	0.0469	3555	27023	14.5%	2.04 [1.86, 2.24]	•
Total (95% CI)			3571	27303	100.0%	1.14 [1.10, 1.18]	
Heterogeneity: Chi <sup>2</sup> = Test for overall effect:			; I² = 99%				0.05 0.2 1 5 20 No MH needs MH needs

# Figure 32: Mental health needs versus no mental health needs as a risk factor for verbal aggression

Study or Subgroup	log[Odds Ratio]	SE		No MH needs I Total	Weight	Odds Ratio IV, Fixed, 95% CI	Odds Ratio IV, Fixed, 95% Cl	
Crocker 2013	0.5188	0.5426	16	280	1.2%	1.68 [0.58, 4.87]		
Jacobson 1982	0.7981	0.0606	3555	27023	98.8%	2.22 [1.97, 2.50]		
Total (95% CI)			3571	27303	100.0%	2.21 [1.97, 2.49]	•	
Heterogeneity: Chi <sup>2</sup> = Test for overall effect:			0%				0.05 0.2 1 5 No MH needs MH needs	20

# Figure 33: Mental health needs versus no mental health needs as a risk factor for destruction of property

Study or Subgroup	log[Odds Ratio] S	E Weight	Odds Ratio IV, Random, 95% CI	Odds Ratio IV, Random, 95% CI
Jacobson 1982	- · · ·		, , ,	
Jacobson 1982	0.5927 0.071	1 49.2%	1.81 [1.57, 2.08]	<b>_</b>
Crocker 2013	0.0488 0.019	8 50.8%	1.05 [1.01, 1.09]	
Total (95% CI)		100.0%	1.37 [0.81, 2.34]	🔶
Heterogeneity: Tau <sup>2</sup> = Test for overall effect:	0.15; Chi <sup>2</sup> = 54.31, df = 1 Z = 1.16 (P = 0.24)	1); l² = 98%	0.05 0.2 1 5 20 No MH needs MH needs	

#### Figure 34: Mental health needs versus no mental health needs as a risk factor for selfinjury

	Mental health	ental health needs No mental health n	needs		Odds Ratio	Odds Ratio		
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% Cl	
Cooper 2009	3	39	47	984	0.8%	1.66 [0.49, 5.59]		
Lundqvist 2013	27	62	256	853	4.2%	1.80 [1.07, 3.03]		
Jacobson 1982	420	3555	2387	27023	95.0%	1.38 [1.24, 1.54]		
Total (95% CI)		3656		28860	100.0%	1.40 [1.26, 1.56]	•	
Total events	450		2690					
Heterogeneity: Tau <sup>2</sup> =	= 0.00; Chi <sup>2</sup> = 1.0	1, df = 2 (l	P = 0.60); I <sup>2</sup> = 0%					
Test for overall effect:	Z = 6.14 (P < 0.0	00001)					0.05 0.2 1 5 No MH needs MH needs	20

## Figure 35: Mental health needs versus no mental health needs as a risk factor for stereotypy

	Mental health	needs	No mental health	needs		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% Cl
Jacobson 1982	262	3555	1623	27023	93.6%	1.25 [1.09, 1.43]	
Lundqvist 2013	31	62	347	853	6.4%	1.46 [0.87, 2.44]	<b>—</b>
Total (95% CI)		3617		27876	100.0%	1.26 [1.10, 1.43]	•
Total events	293		1970				
Heterogeneity: Tau <sup>2</sup> =			P = 0.56); I <sup>2</sup> = 0%				0.05 0.2 1 5 20
Test for overall effect:	. Z = 3.43 (P = 0.	0000)					No MH needs MH needs

### A.2.8 Mobility impairment

# Figure 36: Mobility impairment versus no mobility impairment as a risk factor for all aggression (physical, verbal and destructive)

	Impaired m	obility	No impai	rment		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% CI
Cooper 2009	22	248	78	775	100.0%	0.87 [0.53, 1.43]	
Total (95% CI)		248		775	100.0%	0.87 [0.53, 1.43]	<b>•</b>
Total events	22		78				
Heterogeneity: Not ap Test for overall effect:		0.58)					0.05 0.2 1 5 20 No impairment Impaired mobility

#### Figure 37: Mobility impairment versus no mobility impairment as a risk factor for selfinjury

	Impaired mo	bility	No impair	rment		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
9.2.1 Adults							
Cooper 2009	22	248	78	775	65.1%	0.87 [0.53, 1.43]	
Subtotal (95% CI)		248		775	65.1%	0.87 [0.53, 1.43]	
Total events	22		78				
Heterogeneity: Not ap	plicable						
Test for overall effect:	Z = 0.55 (P = 0	).58)					
9.2.2 C & YP							
Richards 2012	9	13	64	134	34.9%	2.46 [0.72, 8.38]	
Subtotal (95% CI)		13		134	34.9%	2.46 [0.72, 8.38]	
Total events	9		64				
Heterogeneity: Not ap	plicable						
Test for overall effect:	Z = 1.44 (P = 0	).15)					
Total (95% CI)		261		909	100.0%	1.25 [0.47, 3.30]	
Total events	31		142				
Heterogeneity: Tau <sup>2</sup> =	0.31; Chi <sup>2</sup> = 2.3	38, df =	1 (P = 0.12	); I² = 58	3%		1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 +
Test for overall effect:	Z = 0.45 (P = 0)	).65)					0.05 0.2 1 5 20 No impairment Impaired mobility
Test for subgroup diffe	erences: Chi <sup>2</sup> =	2.38, df	= 1 (P = 0.	12), I² =	57.9%		No impairment impaired mobility

#### A.2.9 Visual impairment

# Figure 38: Visual impairment versus no visual impairment as a risk factor for all aggression (physical, verbal and destructive)

	Visual impai	rment	No impai	rment		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% Cl
Cooper 2009	55	481	45	542	68.9%	1.43 [0.94, 2.16]	+∎-
Lundqvist 2013	11	35	304	880	31.1%	0.87 [0.42, 1.80]	
Total (95% CI)		516		1422	100.0%	1.22 [0.78, 1.92]	•
Total events	66		349				
Heterogeneity: Tau <sup>2</sup> = Test for overall effect:	,		1 (P = 0.25)	; I² = 26	%		0.05 0.2 1 5 20 No impairment Visual impairment

#### Figure 39: Visual impairment versus no visual impairment as a risk factor for selfinjury

	Visual impairment	No impairi	nent		Odds Ratio	Odds	Ratio
Study or Subgroup	Events Tota	Events	Total	Weight	M-H, Random, 95% CI	M-H, Rand	om, 95% Cl
10.2.1 C & YP							
Richards 2012 Subtotal (95% CI)	5 6 6		142 <b>142</b>	2.6% <b>2.6%</b>	5.29 [0.60, 46.43] <b>5.29 [0.60, 46.43]</b>		$\rightarrow$
Total events	5	69					
Heterogeneity: Not ap	plicable						
Test for overall effect:	Z = 1.50 (P = 0.13)						
10.2.2 Adults							
Lundqvist 2013	13 35	270	880	25.3%	1.34 [0.66, 2.69]		
Cooper 2009	55 481	45	542	72.1%	1.43 [0.94, 2.16]		-
Subtotal (95% CI)	516		1422	97.4%	1.40 [0.98, 2.00]		◆
Total events	68	315					
Heterogeneity: Tau <sup>2</sup> =	0.00; Chi <sup>2</sup> = 0.03, df =	1 (P = 0.87);	l² = 0%	1			
Test for overall effect:	Z = 1.86 (P = 0.06)						
Total (95% CI)	522		1564	100.0%	1.45 [1.02, 2.06]		◆
Total events	73	384					
Heterogeneity: Tau <sup>2</sup> =	0.00; Chi <sup>2</sup> = 1.43, df =	2 (P = 0.49);	l <sup>2</sup> = 0%				<u> </u>
Test for overall effect:		. //				0.05 0.2 1	Vieuel impeirmen
	erences: Chi <sup>2</sup> = 1.40, df	= 1 (P = 0.24	4),   <sup>2</sup> = 2	28.5%		ivo impairment	Visual impairmen

# Figure 40: Visual impairment versus no visual impairment as a risk factor for stereotypy

	Visual impai	rment	No impai	rment		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% CI
Lundqvist 2013	22	35	356	880	100.0%	2.49 [1.24, 5.01]	
Total (95% CI)		35		880	100.0%	2.49 [1.24, 5.01]	•
Total events	22		356				
Heterogeneity: Not ap Test for overall effect		.01)					0.05 0.2 1 5 20 No impairment Visual impairmen

# A.3 Measures to assess mental health needs among individuals with learning disabilities

# A.3.1 Psychiatric Assessment Schedule for Adults with a Developmental Disability Checklist (PAS-ADD Checklist)

# Figure 41: Sensitivity and specificity of the PAS-ADD Checklist for the detection of mental health needs among adults with learning disabilities

Study	ΤР	FP	FN	ΤN	Sensitivity (95% CI)	Specificity (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)
Moss 1998	32	4	14	9	0.70 [0.54, 0.82]	0.69 [0.39, 0.91]		
Sturmey 2005	76	33	40	77	0.66 [0.56, 0.74]	0.70 [0.61, 0.78] <sub> </sub>		
						(	0.2 0.4 0.6 0.8 1	0 0.2 0.4 0.6 0.8 1

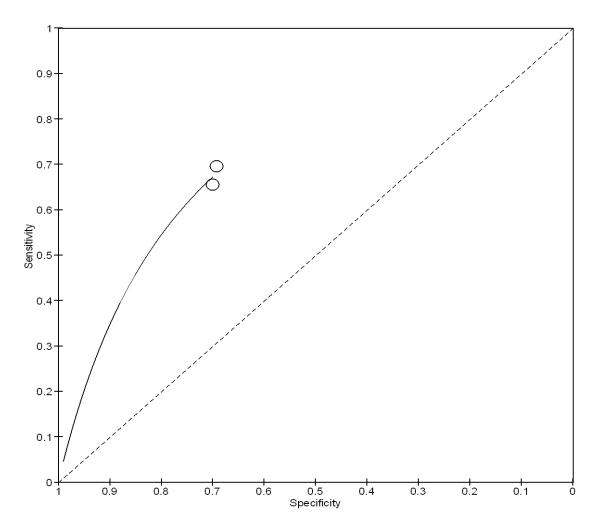
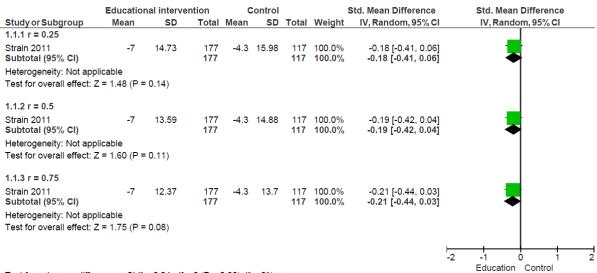


Figure 42: ROC curve for PAS-ADD Checklist (ICD-10 and psychiatric diagnosis [unspecified] reference standard)

### A.4 Interventions aimed at the prevention of behaviour that challenges

#### A.4.1 Educational intervention versus attention control

#### Figure 43: Targeted behaviour that challenges (severity) – post-treatment



Test for subgroup differences:  $Chi^2 = 0.04$ , df = 2 (P = 0.98), I<sup>2</sup> = 0%

#### Figure 44: Adaptive functioning (social) – post-treatment

	Educatior	nal interve	ntion	с	ontrol	I	:	Std. Mean Difference		Std. Me	an Dif	ference	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Rar	ndom,	95% CI	
Strain 2011	42.1	12.6	177	32.7	11.9	117	100.0%	0.76 [0.52, 1.00]					
Total (95% CI)			177			117	100.0%	0.76 [0.52, 1.00]				•	
Heterogeneity: Not ap Test for overall effect:	•	0.00001)							-2	-1 Cont	0 rol Ed	1 ducation	2

#### Figure 45: Adaptive functioning (communication) – post-treatment

	Education	al interve	ntion	C	ontro	bl	\$	Std. Mean Difference		Std. Mea	n Difference	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% Cl		IV, Ranc	lom, 95% Cl	
1.3.1 Total												
Strain 2011	51.3	8.1	177	43.8	7.7	117	100.0%	0.94 [0.70, 1.19]				
Subtotal (95% CI)			177			117	100.0%	0.94 [0.70, 1.19]			-	
Heterogeneity: Not ap	plicable											
Test for overall effect:	Z = 7.51 (P <	0.00001)										
									-2	-1	0 1	
									-	Contro	Education	
Test for subgroup diffe	erences: Not a	pplicable										

up

### A.4.2 Home-based EBI versus centre-based EBI

#### Figure 46: Targeted behaviour that challenges (severity) – post-treatment

	Home	-based	EBI	Centre	-based	EBI	5	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Roberts 2011	52.9	29.3	22	55.7	19.5	22	100.0%	-0.11 [-0.70, 0.48]	
Total (95% CI)			22			22	100.0%	-0.11 [-0.70, 0.48]	-
Heterogeneity: Not ap Test for overall effect:	•	(P = 0.7	71)						-2 -1 0 1 2 Home-based EBI Centre-based EBI

#### Figure 47: Adaptive functioning (social) – post-treatment

	Home-	based	EBI	Centre	-based	EBI	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Roberts 2011	66.4	7.7	27	72.6	11.2	29	100.0%	-0.63 [-1.17, -0.09]	
Total (95% CI)			27			29	100.0%	-0.63 [-1.17, -0.09]	
Heterogeneity: Not ap Test for overall effect:		(P = 0.0	02)						-2 -1 0 1 2 Centre-based EBI Home-based EBI

#### Figure 48: Adaptive functioning (communication) – post-treatment

	Home	-based	EBI	Centre	-based	EBI	\$	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
2.3.1 Total									
Roberts 2011	68.4	15.6	26	76.1	17.1	29	100.0%	-0.46 [-1.00, 0.07]	— <b>—</b> —
Subtotal (95% CI)			26			29	100.0%	-0.46 [-1.00, 0.07]	
Heterogeneity: Not app	olicable								
Test for overall effect: 2	Z = 1.69	(P = 0.0	)9)						
2.3.2 VOID Comphrehe	ension								
Roberts 2011	17.5	6.3	27	23.7	19.9	26	100.0%	-0.42 [-0.96, 0.13]	— <b>—</b> —
Subtotal (95% CI)			27			26	100.0%	-0.42 [-0.96, 0.13]	
Heterogeneity: Not app	licable								
Test for overall effect: 2	Z = 1.50	(P = 0.1	3)						
2.3.3 VOID Expression	n								
Roberts 2011	8.8	8.9	27	11.4	10.9	26	100.0%	-0.26 [-0.80, 0.28]	
Subtotal (95% CI)			27			26	100.0%	-0.26 [-0.80, 0.28]	
Heterogeneity: Not app	licable								
Test for overall effect: 2	Z = 0.93	(P = 0.3	85)						
									-2 -1 0 1
To at fair as the maxim differ			20 16-	- o (n - o	00 12				Centre-based EBI Home-based

Test for subgroup differences: Chi<sup>2</sup> = 0.30, df = 2 (P = 0.86),  $I^2 = 0\%$ 

#### A.4.3 EIBI versus parent training

#### Figure 49: Targeted behaviour that challenges (severity; parent report) – posttreatment

	1	EIBI		Pare	nt Train	ing	:	Std. Mean Difference		Std.	Mean I	Differer	nce	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, I	Randor	n, 95%	CI	
Smith 2000	56.11	9.1	15	59.67	10.41	13	100.0%	-0.36 [-1.10, 0.39]				_		
Total (95% CI)			15			13	100.0%	-0.36 [-1.10, 0.39]						
Heterogeneity: Not ap									-2	-1			1	
Test for overall effect:	Z = 0.93	3 (P =	: 0.35)						-		EIBI	Parent	Trainir	na

#### Figure 50: Targeted behaviour that challenges (severity; teacher report) – posttreatment

		EIBI		Parer	nt Train	ing		Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Smith 2000	60	10.81	15	55.71	5.53	13	100.0%	0.47 [-0.28, 1.23]	
Total (95% CI)			15			13	100.0%	0.47 [-0.28, 1.23]	
Heterogeneity: Not ap	plicable								
Test for overall effect:	Z = 1.23	6 (P = 0.	22)						EIBI Parent Training

#### Figure 51: Adaptive functioning (communication) – post-treatment

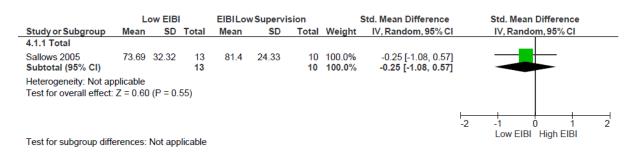
		EIBI		Pare	nt Train	ing	\$	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Smith 2000	87.4	46.21	15	61.33	31.88	13	100.0%	0.63 [-0.13, 1.39]	┼╌╋──╴
Total (95% CI)			15			13	100.0%	0.63 [-0.13, 1.39]	
Heterogeneity: Not ap	•							H	
Test for overall effect:	Z = 1.61	(P = 0.	11)					-	Parent training EIBI

#### Figure 52: Adaptive functioning (global) – post treatment

		EIBI		Pare	nt Train	ing		Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Smith 2000	61.19	29.72	15	58.5	16.58	13	100.0%	0.11 [-0.64, 0.85]	<b>_</b>
Total (95% CI)			15			13	100.0%	0.11 [-0.64, 0.85]	
Heterogeneity: Not ap Test for overall effect:			78)						-2 -1 0 1 2 Parent training EIBI

#### 1.1.1 High supervision EIBI (clinic-directed) versus low supervision EIBI (parentdirected)

#### Figure 53: Adaptive functioning (communication) – post-treatment



#### 1.1.2 Parent training versus any control

#### Figure 54: Targeted behaviour that challenges (severity) – post-treatment

	Paren	t traini	ing	TAU/Att	ention Co	ontrol	9	Std. Mean Difference	S	Std. Mean	Differe	nce	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Rando	m, 95%	CI	
Rickards 2007	-105.8	13.2	29	-100.8	11.2	28	100.0%	-0.40 [-0.93, 0.12]		-	+		
Total (95% CI)			29			28	100.0%	-0.40 [-0.93, 0.12]			+		
Heterogeneity: Not ap Test for overall effect:		(P = 0.	13)						-2 Paren	-1 nt training	I 0 TAU (	1 Control	2

Challenging behaviour and learning disabilities

#### Figure 55: Targeted behaviour that challenges (severity) – follow-up

	Paren	t trainir	ng	TAU/At	tention Co	ntrol	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
5.2.1 26 week follow-	up								
Tonge 2006	53.29	24.36	35	57.61	19.72	35	58.6%	-0.19 [-0.66, 0.28]	
Subtotal (95% CI)			35			35	58.6%	-0.19 [-0.66, 0.28]	
Heterogeneity: Not app	olicable								
Test for overall effect:	Z = 0.80 (	P = 0.42	2)						
5.2.2 52 week follow-	up								
Rickards 2007	-109.17	13	24	-99.48	17.3	23	41.4%	-0.62 [-1.21, -0.04]	
Subtotal (95% CI)			24			23	41.4%	-0.62 [-1.21, -0.04]	
Heterogeneity: Not app	olicable								
Test for overall effect:	Z = 2.09 (	P = 0.04	4)						
Total (95% CI)			59			58	100.0%	-0.37 [-0.79, 0.05]	-
Heterogeneity: Tau <sup>2</sup> =	0.02; Chi <sup>2</sup>	= 1.27,	df = 1 (	P = 0.26);	l² = 21%				
Test for overall effect:	Z = 1.75 (	P = 0.08	3)						-2 -1 U 1 Parent training TAU/Control
Test for subgroup diffe	rences: C	hi² = 1.2	27, df =	1 (P = 0.2	6), <b>I</b> ² = 21.1	1%			Tarent training TAO/Control

### Figure 56: Adaptive functioning (global) – post-treatment

	Parer	nt train	ing	TAU/Atte	ention Co	ontrol		Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Rickards 2007	64.3	20.4	30	59.2	19.7	28	100.0%	0.25 [-0.27, 0.77]	
Total (95% CI)			30			28	100.0%	0.25 [-0.27, 0.77]	-
Heterogeneity: Not ap Test for overall effect:		(P = 0	.34)						-2 -1 0 1 2 TAU/Control Parent training

### Figure 57: Adaptive functioning (global) – follow-up

	Pare	nt train	ing	TAU/Att	ention Co	ontrol	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
5.4.1 26 week follow	-up								
Tonge 2006 Subtotal (95% CI)	68.26	16.46	35 <b>35</b>	57.81	13.98	33 <b>33</b>	56.2% <b>56.2%</b>	0.67 [0.19, 1.16] 0.67 [0.19, 1.16]	-
Heterogeneity: Not ap Test for overall effect		) (P = 0	.007)						
5.4.2 52 week follow	-up								
Rickards 2007 Subtotal (95% CI)	66.43	21.9	28 <b>28</b>	59.83	19	23 23	43.8% <b>43.8</b> %	0.31 [-0.24, 0.87] 0.31 [-0.24, 0.87]	
Heterogeneity: Not ap Test for overall effect	•	(P = 0	27)						
Total (95% CI)			63			56	100.0%	0.52 [0.15, 0.88]	•
Heterogeneity: Tau <sup>2</sup> =	= 0.00; Cł	ni² = 0.9	1, df = 1	(P = 0.34	); I <sup>2</sup> = 0%				-2 -1 0 1
Test for overall effect	Z = 2.76	(P = 0	006)	-					-2 -1 U 1 TAU/Control Parent training
Test for subgroup diff	erences:	Chi <sup>2</sup> = (	).91, df :	= 1 (P = 0.	34), I <sup>2</sup> = 0	%			TAO/CONTO Faterit training

#### Figure 58: Adaptive functioning (communication) – follow-up

	Pare	nt train	ing	TAU/Att	ention Co	ontrol		Std. Mean Difference		Std. M	ean Differ	ence	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Ra	ndom, 95	% CI	
5.5.1 26 week													
Tonge 2006	71.71	19.83	35	58.03	15.71	33	100.0%	0.75 [0.26, 1.25]				-	
Subtotal (95% CI)			35			33	100.0%	0.75 [0.26, 1.25]					
Heterogeneity: Not ap	plicable												
Test for overall effect:	Z = 2.99	(P = 0.	003)										
									⊢	1		1	
Toot for subgroup diff		NI-4	C						-2	TAU/Cor	trol Pare	nt traini	ng 2

Test for subgroup differences: Not applicable

### A.5 Interventions aimed at reducing health risks and increasing understanding of physical illness or mental health problems in relation to the prevention or management of the behaviour that challenges

### A.5.1 Hand-held health records (HHHR) versus treatment as usual

#### Figure 59: Health promotion

	Hand-held health re	cord	TAU			Risk Ratio	Risk Ratio
Study or Subgroup	Events				Weight		M-H, Random, 95% Cl
1.1.1 Blood pressure	checked						
Lennox 2010	28	51	32	68	39.4%	1.17 [0.82, 1.66]	
Subtotal (95% CI) Total events	28	51	32	68	39.4%	1.17 [0.82, 1.66]	
Heterogeneity: Not app			32				
Test for overall effect:							
1.1.2Constipation inv	-						
Lennox 2010 Subtotal (95% CI)	5	51 51	1	68 68	2.4% 2.4%	6.67 [0.80, 55.33] 6.67 [0.80, 55.33]	
Total events	5	0.	1		2.11/0		
Heterogeneity: Not app							
Test for overall effect:	Z = 1.76 (P = 0.08)						
4495-11-11-11-11-11-11-11-11-11-11-11-11-11							
1.1.3 Epilepsy review	44	E 4		60	12 20/	1 02 00 00 1 221	
Lennox 2010 Subtotal (95% CI)	11	51 51	8	68 68	13.2% 13.2%	1.83 [0.80, 4.23] 1.83 [0.80, 4.23]	
Total events	11		8				
Heterogeneity: Not app	olicable						
Test for overall effect:	Z = 1.42 (P = 0.15)						
1.1.4 Hearing test							
Lennox 2010	3	51	2	68	3.5%	2.00 [0.35, 11.53]	,
Subtotal (95% CI)	5	51	2	68	3.5%	2.00 [0.35, 11.53]	
Total events	3		2				
Heterogeneity: Not app							
Test for overall effect:	Z = 0.78 (P = 0.44)						
1.1.5 Vision test							
Lennox 2010	7	51	4	68	7.3%	2.33 [0.72, 7.55]	
Subtotal (95% CI)	-	51		68	7.3%	2.33 [0.72, 7.55]	
Total events Heterogeneity: Not app	7 Dicable		4				
Test for overall effect:							
1.1.6 Weight measure							
Lennox 2010 Subtotal (95% CI)	18	51 51	17	68 68	24.1% 24.1%	1.41 [0.81, 2.46] 1.41 [0.81, 2.46]	
Total events	18	31	17	00	24.170	1.41 [0.01, 2.40]	
Heterogeneity: Not app							
Test for overall effect:							
4 4 7 Maight more and	mentalan						
1.1.7 Weight manager Lennox 2010	ment plan 5	E4	12	68	10.1%	0.56 (0.04, 4, 40)	
Subtotal (95% CI)	5	51 51	12	68	10.1%	0.56 [0.21, 1.48] 0.56 [0.21, 1.48]	
Total events	5		12				
Heterogeneity: Not app							
Test for overall effect:	Z = 1.18 (P = 0.24)						
Total (95% CI)		357		476	100.0%	1.35 [0.96, 1.88]	
Total events	77	331	76	410	100.070	100 [0.00, 1.00]	-
Heterogeneity: Tau <sup>2</sup> =		6 (P = (		21%			0.2 0.5 1 2 5
Test for overall effect:		-	- *				0.2 0.5 1 2 5 TAU HHHR
Test for subgroup diffe	rences: Chi <sup>2</sup> = 7.47, df	= 6 (P	= 0.28), I <sup>2</sup>	= 19.7	%		

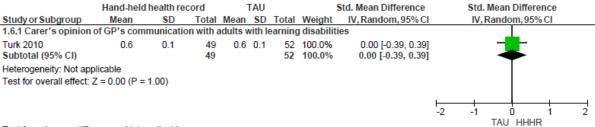
#### Figure 60: Carer knowledge of health problems

	Hand-held	health re	cord		TAU			Std. Mean Difference		Std.	Mean Diff	erence	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% Cl		IV,	Random, 9	95% CI	
Turk 2010	11.8	0.3	70	11.8	0.2	74	100.0%	0.00 [-0.33, 0.33]					
Total (95% CI)			70			74	100.0%	0.00 [-0.33, 0.33]			+		
Heterogeneity: Not ap Test for overall effect:		1.00)							-2	-1		1 IHR	2

#### Figure 61: Service user knowledge of health problems

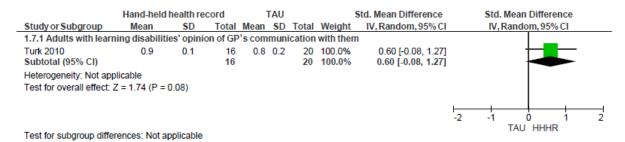
	Hand-held	health re	cord		TAU			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% Cl	IV, Random, 95% CI
Turk 2010	9	2.2	34	9.8	2.7	32	100.0%	-0.32 [-0.81, 0.16]	
Total (95% CI)			34			32	100.0%	-0.32 [-0.81, 0.16]	
Heterogeneity: Not ap Test for overall effect:	•	D.19)							-2 -1 0 1 2 TAU HHHR

#### Figure 62: Carer satisfaction



Test for subgroup differences: Not applicable

#### Figure 63: Service user satisfaction



### Figure 64: Premature death

	Hand-held health r	ecord	cord TAU			Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Events Total		M-H, Random, 95% Cl	M-H, Random, 95% CI
Turk 2010	5	81	2	88	100.0%	2.72 [0.54, 13.61]	
Total (95% CI)		81		88	100.0%	2.72 [0.54, 13.61]	
Total events	5		2				
Heterogeneity: Not ap	plicable						0.5 0.7 1 1.5 2
Test for overall effect:	Z = 1.22 (P = 0.22)						HHHR TAU

#### A.5.2 Annual health check versus treatment as usual

### Figure 65: Health promotion

	Annual c	heck	TAU			Risk Ratio	Risk Ratio
Study or Subgroup	Events			Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% Cl
2.1.1 Blood pressure							
Lennox 2010 Lennox 2007	26 117	53 234	32 99	68 219	21.3% 78.7%	1.04 [0.72, 1.51] 1.11 [0.91, 1.34]	
Subtotal (95% CI)	117	287	99		100.0%	1.09 [0.92, 1.30]	
Total events	143		131				-
Heterogeneity: Tau <sup>a</sup> =	0.00; Chi <sup>a</sup> =	0.08, df	= 1 (P =	0.78);	l² = 0%		
Test for overall effect:	Z = 1.00 (P	= 0.32)					
2.1.2Constipation Inv	ectigation						
Lennox 2010	esugation 4	53	1	89	100.0%	5.13 [0.59, 44.58]	
Subtotal (95% CI)	-	53			100.0%	5.13 [0.59, 44.58]	
Total events	4		1				
Heterogeneity: Not app	plicable						
Test for overall effect:	Z = 1.48 (P	= 0.14)					
2.1.3 Epilepsy review							
Lennox 2010	9	53	8	68	100.0%	1.44 [0.60, 3.49]	
Subtotal (95% CI)	- C	53	Ŭ		100.0%	1.44 [0.60, 3.49]	
Total events	9		8				
Heterogeneity: Not app	plicable						
Test for overall effect:	Z = 0.82 (P	= 0.41)					
2.1.4 Hearing test							
Lennox 2007	32	234	1	219	41.8%	29.95 [4.13, 217.30]	
Lennox 2010	10	53	2	68	58.2%	6.42 [1.47, 28.04]	
Subtotal (95% CI)		287		287	100.0%	12.22 [2.43, 61.49]	
Total events	42		3				
Heterogeneity: Tau <sup>2</sup> = Test for overall effect:				0.18);	I² = 43%		
resctor overall effect.	2 - 3.04 (F	- 0.002)					
2.1.5 Vision test							
Lennox 2010	11	53	4	68	23.6%	3.53 [1.19, 10.46]	
Lennox 2007	49	234	12	219	76.4%	3.82 [2.09, 6.99]	
Subtotal (95% CI)		287		287	100.0%	3.75 [2.21, 6.36]	
Total events Heterogeneity: Tau <sup>2</sup> =	60 0.00: Chiž =	0.02 4	16 = 1 /P =	0.001-	12 = 0%		
Test for overall effect:				0.80),	1-0%		
			.,				
2.1.6 Acuity corrected							
Lennox 2007 Subtotal (95% CI)	3	234 234	0		100.0% 100.0%	6.55 [0.34, 126.14] 6.55 [0.34, 126.14]	
Subtotal (95% CI) Total events	3	204	0	213	100.076	0.33 [0.34, 120.14]	
Heterogeneity: Not app							
Test for overall effect:		= 0.21)					
2.1.7 Otoscopic exam							
Lennox 2007 Subtotal (95% CI)	92	234 234	50		100.0% 100.0%	1.72 [1.29, 2.30] 1.72 [1.29, 2.30]	
Total events	92	204	50	2.10	100.070	1.12 [1.20, 2.00]	
Heterogeneity: Not app							
Test for overall effect:	Z = 3.66 (P	= 0.0003	3)				
2.1.8 Weight measure	amont						
Lennox 2010	29	53	17	89	32.6%	2.19 [1.36, 3.53]	
Lennox 2007	100	234		219		2.60 [1.86, 3.63]	
Subtotal (95% CI)		287			100.0%	2.46 [1.87, 3.23]	
Total events	129		53				
Heterogeneity: Tau <sup>2</sup> =	-	-		0.56);	I <sup>2</sup> = 0%		
Test for overall effect:	Z = 0.44 (P	< 0.0000	<i>n</i> )				
2.1.9 Weight manage	ment plan						
Lennox 2007	. 7	234	1	219	26.1%	6.55 [0.81, 52.82]	
Lennox 2010	15	53	12	68		1.60 [0.82, 3.13]	
Subtotal (95% CI)		287		287	100.0%	2.32 [0.66, 8.14]	
Total events	22 0.44: Chill -	1 70 df	13	0 101-	12 - 419/		
Heterogeneity: Tau <sup>a</sup> =	0.44: Uni* =	· 1.70. df	-104=	0.191	1 = 41%		
Test for overall effect:	Z = 1.31 (P	= 0.19)					
							0.5 0.7 1 1.5 2
Testformer					00041-17	- 02.08/	TAU Annual check
Test for subgroup diffe	rences: Chi	• = 46.84	, df = 8 (l	0.0 > ۲	J0001), I*	= 82.9%	

Challenging behaviour and learning disabilities

### Figure 66: Identification of health problems

	Annual c		TAU			Risk Ratio	Risk	Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% (	CI M-H, Rand	om, 95% Cl
2.2.1 Hearing loss								
Lennox 2007 Subtotal (95% CI)	15	234 234	0		100.0% 100.0%	29.02 [1.75, 482.1 29.02 [1.75, 482.1		
Total events	15		0					
Heterogeneity: Not app								
Test for overall effect:	Z = 2.35 (P	= 0.02)						
2.2.2 Visual impairme								
Lennox 2007	7	234	1		100.0%	6.55 [0.81, 52.8]		
Subtotal (95% CI)	_	234		219	100.0%	6.55 [0.81, 52.82	2]	
Total events	7 Niceble		1					
Heterogeneity: Not app Test for overall effect:		- 0.00)						
rescior overall effect.	Z = 1.11 (F	- 0.00)						
2.2.3 Obesity								
Lennox 2007 Subtotal (95% CI)	17	234 234	4		100.0% 100.0%	3.98 [1.36, 11.64 3.98 [1.36, 11.64		
Total events	17		4					
Heterogeneity: Not app	plicable							
Test for overall effect:	Z = 2.52 (P	= 0.01)						
2.2.4 VOID New disea	ise, total							
Lennox 2010	2	53	2	68	9.7%	1.28 [0.19, 8.8 <sup>,</sup>	1] ←	
Lennox 2007	24	231	14	218	90.3%	1.62 [0.86, 3.0	5]	<b>→</b>
Subtotal (95% CI)		284		286	100.0%	1.58 [0.87, 2.89	9]	
Total events	26		16					
Heterogeneity: Tau <sup>2</sup> =				: 0.82);	l² = 0%			
Test for overall effect:	Z = 1.50 (P	= 0.13)						
2.2.5 VOID Raised cho	olesterol							
Lennox 2007	18	234	7		100.0%	2.41 [1.03, 5.65		
Subtotal (95% CI)		234		219	100.0%	2.41 [1.03, 5.65	5]	
Total events	18		7					
Heterogeneity: Not app								
Test for overall effect:	Z = 2.02 (P	= 0.04)						
							I	
							0.5 0.7	1 1.5 2
Test for subgroup diffe	erences: Ch	i² = 6.59	), df = 4 (l	<sup>o</sup> = 0.10	6), I² = 39.	3%	TAU	Annual check

#### Figure 67: Premature death

	Annual o	heck	TAU	J		Risk Ratio	Risk	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Rand	om, 95% CI	
Lennox 2007	1	234	1	219		0.94 [0.06, 14.87]	0.5 0.7 Annual check	1 1.5 TAU	2

### A.5.3 Annual health check versus hand-held health record

### Figure 68: Health promotion

### Appendix P: Forest Plots

	Annual health		Hand-held health			Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	lotal	Weight	M-H, Random, 95% CI	M-H, Random, 95% Cl
3.1.1 Blood pressure		50	20	54	25.29/	0.00 (0.62, 4.20)	
Lennox 2010 Subtotal (95% CI)	26	53 53	28	51 51	25.3% 25.3%	0.89 [0.62, 1.29] 0.89 [0.62, 1.29]	
Total events Heterogeneity: Not app Test for overall effect: 2		5)	28				
3.1.2Constipation invo	-	-,					
Lennox 2010	4	53	5	51	7.2%	0.77 [0.22, 2.71]	· · · · · · · · · · · · · · · · · · ·
Subtotal (95% CI)		53	-	51	7.2%	0.77 [0.22, 2.71]	
Total events Heterogeneity: Not app Test for overall effect: 2		B)	5				
3.1.3 Epilepsy review							
Lennox 2010 Subtotal (95% CI)	9	53 53	11	51 51	13.7% 13.7%	0.79 [0.36, 1.74] 0.79 [0.36, 1.74]	· · · · ·
Total events	9		11			6110 [0100, 1111]	
Heterogeneity: Not app Test for overall effect: 2		5)					
3.1.4 Hearing test							
Lennox 2010 Subtotal (95% CI)	10	53 53	3	51 51	7.5% 7.5%	3.21 [0.94, 10.99] 3.21 [0.94, 10.99]	
Total events Heterogeneity: Not app			3				
Test for overall effect: 2	2 = 1.85 (P = 0.0	5)					
3.1.5 Vision test			-				
Lennox 2010 Subtotal (95% CI)	11	53 53	7	51 51	12.3% 12.3%	1.51 [0.64, 3.60] 1.51 [0.64, 3.60]	
Total events Heterogeneity: Not app Test for overall effect: 2		5)	7				
3.1.6 Weight measure	ed						
Lennox 2010 Subtotal (95% CI)	29	53 53	18	51 51	22.9% 22.9%	1.55 [0.99, 2.42] 1.55 [0.99, 2.42]	
Total events	29	55	18	51	22.370	1.55 [0.55, 2.42]	
Heterogeneity: Not app Test for overall effect: 2		5)					
3.1.7 Weight manager	nent plan						
Lennox 2010 Subtotal (95% CI)	. 15	53 53	5	51 51	11.1% 11.1%	2.89 [1.13, 7.36] 2.89 [1.13, 7.36]	
Total events Heterogeneity: Not app	15 blicable		5			[,]	
Test for overall effect: 2	Z = 2.22 (P = 0.0	3)					
Total (95% CI)		371		357	100.0%	1.32 [0.90, 1.93]	
Total events	104 0.42: Chiž = 14.7	1. df = 0.17	77				
Heterogeneity: Tau <sup>2</sup> = (	0.12; Chi* = 11.7	1,df=6(F 6)	r = 0.07); If = 49%				0.5 0.7 1 1.5

### A.5.4 Hand-held health record and annual health check versus treatment as usual

### Figure 69: Health promotion

Study or Subgroup	HHHR/Annual Events		TAU Events	Total	Weight	Risk Ratio M-H, Random, 95% Cl	Risk Ratio M-H, Random, 95% Cl
4.1.1 Blood pressure (		Total	Litenta	rotal	regint	an ri, rundon, oo A O	
Lennox 2010	46	70	32	68	21.6%	1.40 [1.03, 1.89]	<b>_</b>
Subtotal (95% CI)		70		68	21.6%	1.40 [1.03, 1.89]	
Total events	46		32				
Heterogeneity: Not app	licable						
Test for overall effect: 2	2 = 2.16 (P = 0.03	3)					
I.1.2Constipation inve	stigation						
ennox 2010	sugation 4	70	1	68	3.9%	3.89 [0.45, 33.89]	$\leftarrow$
Subtotal (95% CI)	-	70		68	3.9%	3.89 [0.45, 33.89]	
Total events	4	10	1		3.376	0.00 [0.40, 00.00]	
Heterogeneity: Not app							
Fest for overall effect: 2		2)					
		·					
4.1.3 Epilepsy review	-	70			11.00	0.05 10.00 0.000	·
Lennox 2010 Subtotal (95% CI)	7	70 70	8	68 68	11.9% 11.9%	0.85 [0.33, 2.22] 0.85 [0.33, 2.22]	
	7	10	8	00	11.370	0.05 [0.55, 2.22]	
Total events Heterogeneity: Not app	7 licable		8				I
Test for overall effect: 2		6					I
4.1.4 Hearing test							I .
Lennox 2010	10	70	2	68	7.1%	4.86 [1.10, 21.36]	───→
Subtotal (95% CI)		70	_	68	7.1%	4.86 [1.10, 21.36]	
Total events	10		2				I
Heterogeneity: Not app							I
Test for overall effect: 2	. = 2.09 (P = 0.04	•)					
1.1.5 Vision test							
Lennox 2010	20	70	4	68	11.2%	4.86 [1.75, 13.47]	→
Subtotal (95% CI)		70		68	11.2%	4.86 [1.75, 13.47]	
Total events	20		4				I
Heterogeneity: Not app							I
Test for overall effect: 2	2 = 3.04 (P = 0.00	02)					
4.1.6 Weight measure	d						
Lennox 2010	41	70	17	68	19.4%	2.34 [1.48, 3.70]	$  \longrightarrow$
Subtotal (95% CI)		70		68	19.4%	2.34 [1.48, 3.70]	
Total events	41		17				I
Heterogeneity: Not app							I
Test for overall effect: 2	2 = 3.66 (P = 0.00	003)					
I.1.7 Weight manager	nent plan						
ennox 2010	7	70	12	68	13.1%	0.57 [0.24, 1.35]	←■────
Subtotal (95% CI)		70		68	13.1%	0.57 [0.24, 1.35]	
Total events	7		12				
Heterogeneity: Not app	licable						I
Test for overall effect: 2		))					
1.1.8 Epilepsy review							
Lennox 2010	7	70	8	68	11.9%	0.85 [0.33, 2.22]	← →
Subtotal (95% CI)		70	-	68	11.9%	0.85 [0.33, 2.22]	
Total events	7		8				
Heterogeneity: Not app	licable						I
Test for overall effect: 2		4)					
Total (95% CI)		560		544	100.0%	1.59 [1.00, 2.55]	
	142	300	84	044	100.070	1.00 [1.00, 2.00]	
Total events	142		04				1
Fotal events Heterogeneity: Tau <sup>a</sup> = (	24· Chi <sup>2</sup> = 10 90	df = 7	P = 0.008	$ \cdot ^2 = 0$	35%		
Fotal events Heterogeneity: Tauª = 0 Fest for overall effect: 2			P = 0.006	); I² = (	35%		0.5 0.7 1 1.5 2 TAU HHHR/Annual Cl

# A.6 Environmental change interventions aimed at reducing and managing behaviour that challenges

### A.6.1 Sensory intervention versus any control

#### Figure 70: Targeted behaviour that challenges (global) – post-treatment

Sensory			,	С	ontrol		:	Std. Mean Difference	Std. Mean Difference		
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Ra	ndom, 95% Cl	
1.1.1 r= 0.25											
Chan 2005	-0.2	1.11	48	-1.6	0.8	41	100.0%	1.42 [0.95, 1.88]			
Subtotal (95% CI)			48			41	100.0%	1.42 [0.95, 1.88]		-	
Heterogeneity: Not app	licable										
Test for overall effect: 2	Z = 5.93	(P < (	0.00001	)							
4 4 0 - 0 5											
1.1.2 r= 0.5										<b>—</b> .	
Chan 2005	-0.2	0.92	48	-1.6	0.69		100.0%	1.69 [1.20, 2.18]			
Subtotal (95% CI)			48			41	100.0%	1.69 [1.20, 2.18]			
Heterogeneity: Not app	licable										
Test for overall effect: 2	Z = 6.78	(P < (	0.00001	)							
1.1.3 r= 0.75											
Chan 2005	-0.2	0.67	48	-1.6	0.57	41	100.0%	2.22 [1.68, 2.75]		$\rightarrow$	
Subtotal (95% CI)			48			41	100.0%	2.22 [1.68, 2.75]		▲	
Heterogeneity: Not app	licable										
Test for overall effect: 2		(P < (	0.00001	)							
				, ,							
									-2 -1	0 1 2	
Test for subgroup diffe	rences:	Chi² =	4.95, c	lf = 2 (P	= 0.08	8), I² =	59.6%		Sens	ory Control	

#### Figure 71: Targeted behaviour that challenges (global) – follow up at 12 weeks

	Se	ensory		С	ontrol			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
1.2.1 r= 0.25									
Chan 2005	-1	1.11	48	-1	0.77	41	100.0%	0.00 [-0.42, 0.42]	
Subtotal (95% CI)			48			41	100.0%	0.00 [-0.42, 0.42]	$\bullet$
Heterogeneity: Not ap	plicable								
Test for overall effect:	Z = 0.00	) (P = 1	1.00)						
1.2.2 r= 0.5									
Chan 2005	-1	0.92	48	-1	0.72	41	100.0%	0.00 [-0.42, 0.42]	
Subtotal (95% CI)			48			41	100.0%	0.00 [-0.42, 0.42]	
Heterogeneity: Not ap	plicable								
Test for overall effect:	Z = 0.00	) (P = 1	1.00)						
1.2.3 r= 0.75									
Chan 2005	-1	0.67	48	-1	0.67	41	100.0%	0.00 [-0.42, 0.42]	
Subtotal (95% CI)			48			41	100.0%	0.00 [-0.42, 0.42]	
Heterogeneity: Not ap	plicable								
Test for overall effect:	Z = 0.00	) (P = 1	(00.1						
									2 -1 0 1
T									Sensory Control

Test for subgroup differences:  $Chi^2 = 0.00$ , df = 2 (P = 1.00),  $I^2 = 0\%$ 

# Figure 72: Targeted behaviour that challenges (self-injurious behaviour; severity) – post-treatment

	Se	nsor	у	Co	ontro	l.	:	Std. Mean Difference	S	Std. Mean	Differen	се	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Rando	m, 95% (		
Lundqvist 2009	6.7	4.7	10	7.8	5.6	10	100.0%	-0.20 [-1.08, 0.68]					
Total (95% CI)			10			10	100.0%	-0.20 [-1.08, 0.68]					
Heterogeneity: Not ap	olicable							⊢ -2	)	-1 (		1	
Test for overall effect:	Z = 0.45	5 (P =	0.65)					-2	-	Sensory	Control		2

# Figure 73: Targeted behaviour that challenges (self-injurious behaviour; frequency) – post-treatment

	Se	nsor	у	C	ontro	l.	:	Std. Mean Difference		Std. M	ean Diffe	rence	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Ra	ndom, 98	5% CI	
Lundqvist 2009	8	7.1	10	9.9	7.2	10	100.0%	-0.25 [-1.14, 0.63]				_	
Total (95% CI)			10			10	100.0%	-0.25 [-1.14, 0.63]				-	
Heterogeneity: Not ap Test for overall effect:	· · · · · · · · · · · · · · · · · · ·		0.57)						-2	-1 Sens	0 ory Con	1 Itrol	2

## Figure 74: Targeted behaviour that challenges (stereotypical behaviour; severity) – post-treatment

	Se	nsor	у	Co	ontro	ol –	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Lundqvist 2009	10.6	9	10	7.9	6.5	10	100.0%	0.33 [-0.55, 1.21]	
Total (95% CI)			10			10	100.0%	0.33 [-0.55, 1.21]	
Heterogeneity: Not ap Test for overall effect:	•		0.47)					-2	2 -1 0 1 2 Sensory Control

### Figure 75: Targeted behaviour that challenges (stereotypical behaviour; frequency) – post-treatment

	Se	nsor	у	Co	ontro	ol –	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Lundqvist 2009	5.5	6.2	10	7	7.1	10	100.0%	-0.22 [-1.10, 0.66]	
Total (95% CI)			10			10	100.0%	-0.22 [-1.10, 0.66]	
Heterogeneity: Not ap Test for overall effect:	· · · · · · · · · · · · · · · · · · ·		0.63)					-2	-1 0 1 2 Sensory Control

#### Figure 76: Targeted behaviour that challenges (aggressive/destructive behaviour; severity) – post-treatment

	Se	nsor	у	Control				Std. Mean Difference	Std. Mean Difference					
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Ra	ndom, 9	5% CI		
Lundqvist 2009	6.6	6	10	7.7	7.6	10	100.0%	-0.15 [-1.03, 0.72]						
<b>Total (95% CI)</b> Heterogeneity: Not ap Test for overall effect:		+ (P =	<b>10</b> 0.73)			10	100.0%	-0.15 [-1.03, 0.72]	⊢ -2	-1 Sens	0 sory Cor	1 1 ntrol	2	

#### Figure 77: Targeted behaviour that challenges (aggressive/destructive behaviour; frequency) - post-treatment

	Se	nsor	у	Co	ontro	ol –		Std. Mean Difference		Std. M	ean Diffe	erence	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Ra	ndom, 9	5% CI	
Lundqvist 2009	5.5	6.2	10	7	7.1	10	100.0%	-0.22 [-1.10, 0.66]					
Total (95% CI)			10			10	100.0%	-0.22 [-1.10, 0.66]				-	
Heterogeneity: Not ap Test for overall effect:	•		0.63)						-2	-1 Sens	0 ory Cor	1 ntrol	2

#### Figure 78: Adaptive functioning – post treatment

	Se	ensory	/	Control			:	Std. Mean Difference	Std. Mean Difference				
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% Cl				
1.9.1 r= 0.25													
Chan 2005	2.5	1.7	48 <b>48</b>	4.8	2.82	41 <b>41</b>	100.0% <b>100.0%</b>	-1.00 [-1.44, -0.56]					
Subtotal (95% CI)	ulicable		40			41	100.0%	-1.00 [-1.44, -0.56]					
Heterogeneity: Not ap			0001										
Test for overall effect:	Z = 4.42	(P < )	J.0001)										
1.9.2 r= 0.5													
Chan 2005	2.5	1.48	48	4.8	2.55	41	100.0%	-1.12 [-1.57, -0.67]					
Subtotal (95% CI)			48			41	100.0%	-1.12 [-1.57, -0.67]	$\bullet$				
Heterogeneity: Not ap	plicable												
Test for overall effect:	Z = 4.87	(P < (	0.0000	1)									
1.9.3 r= 0.75													
Chan 2005	2.5	1.16	48	4.8	2.25	41	100.0%	-1.30 [-1.77, -0.84]					
Subtotal (95% CI)			48			41	100.0%	-1.30 [-1.77, -0.84]	$\bullet$				
Heterogeneity: Not ap	plicable												
Test for overall effect:	Z = 5.55	(P < (	0.0000	1)									
									-2 -1 0 1				
									Control Sensory				
Test for subgroup diffe	erences.	$Chi^2 =$	0.89 0	If = 2 (P	P = 0.64	4) $ ^2 =$	0%						

Test for subgroup differences:  $Chi^2 = 0.89$ , df = 2 (P = 0.64), I<sup>2</sup> = 0%

#### Figure 79: Adaptive functioning – follow-up at 12 weeks

	Se	ensory	,	С	Control		5	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
1.10.1 r= 0.25									
Chan 2005	3.3	1.91	48	4.3	2.91	41	100.0%	-0.41 [-0.83, 0.01]	
Subtotal (95% CI)			48			41	100.0%	-0.41 [-0.83, 0.01]	
Heterogeneity: Not app	licable								
Test for overall effect: 2	Z = 1.90	(P=0	0.06)						
1.10.2 r= 0.5									_
Chan 2005	3.3	1.64	48	4.3	2.51	41	100.0%	-0.48 [-0.90, -0.05]	
Subtotal (95% CI)			48			41	100.0%	-0.48 [-0.90, -0.05]	
Heterogeneity: Not app	licable								
Test for overall effect: 2	Z = 2.20	(P = (	0.03)						
1.10.3 r= 0.75									_
Chan 2005	3.3	1.33	48	4.3	2.03	41	100.0%	-0.59 [-1.01, -0.16]	
Subtotal (95% CI)			48			41	100.0%	-0.59 [-1.01, -0.16]	
Heterogeneity: Not app	licable								
Test for overall effect: 2	Z = 2.70	(P = 0	0.007)						
								-2	
								-2	Control Sensory

Test for subgroup differences: Chi<sup>2</sup> = 0.35, df = 2 (P = 0.84), l<sup>2</sup> = 0%

### A.6.2 Structured activity versus unstructured activity

#### Figure 80: Targeted behaviour that challenges (severity) – post-treatment

	Str	ucture	ł	Uns	tructur	ed	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
2.1.1 r = 0.25									
Gencoz 1997	-14.1	12.31	13	-1.33	21	13	100.0%	-0.72 [-1.52, 0.08]	
Subtotal (95% CI)			13			13	100.0%	-0.72 [-1.52, 0.08]	
Heterogeneity: Not app	plicable								
Test for overall effect:	Z = 1.77	(P = 0.	08)						
2.1.2 r = 0.5									
Gencoz 1997	-14.1	10.07	13	-1.33	17.31	13	100.0%	-0.87 [-1.68, -0.06]	
Subtotal (95% CI)			13			13	100.0%	-0.87 [-1.68, -0.06]	
Heterogeneity: Not app	plicable								
Test for overall effect:	Z = 2.11	(P = 0.	03)						
2.1.3 r = 0.75									
Gencoz 1997	-14.1	7.16	13	-1.33	12.58	13	100.0%	-1.21 [-2.06, -0.36]	←
Subtotal (95% CI)			13			13	100.0%	-1.21 [-2.06, -0.36]	
Heterogeneity: Not app	plicable								
Test for overall effect:	Z = 2.79	(P = 0.	005)						
									-2 -1 0 1
									Structured Unstructure

Test for subgroup differences: Chi<sup>2</sup> = 0.70, df = 2 (P = 0.70),  $I^2 = 0\%$ 

#### Figure 81: Targeted behaviour that challenges (severity) – follow-up at six weeks

	Stru	ucture	d	Uns	Unstructured			Std. Mean Difference	Std. Mean Differ	ence
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95%	∕₀CI
2.2.1 r = 0.25										
Gencoz 1997	-13.5	11.5	13	-1.56	17.52	13	100.0%	-0.78 [-1.58, 0.02]		
Subtotal (95% CI)			13			13	100.0%	-0.78 [-1.58, 0.02]		
Heterogeneity: Not ap	plicable									
Test for overall effect:	Z = 1.91	(P = (	0.06)							
2.2.2 r = 0.5										
Gencoz 1997	-13.5	9.51	13	-1.56	14.32	13	100.0%	-0.95 [-1.77, -0.13]		
Subtotal (95% CI)			13			13	100.0%	-0.95 [-1.77, -0.13]		
Heterogeneity: Not ap	plicable									
Test for overall effect:	Z = 2.28	(P=(	0.02)							
2.2.3 r = 0.75										
Gencoz 1997	-13.5	6.99	13	-1.56	10.16	13	100.0%	-1.33 [-2.19, -0.46]	←	
Subtotal (95% CI)			13			13	100.0%	-1.33 [-2.19, -0.46]		
Heterogeneity: Not ap	plicable									
Test for overall effect:	Z = 3.01	(P = (	0.003)							
									-2 -1 0	1
Toot for subgroup diffe							~ /		Structured Unstr	ucture

Test for subgroup differences:  $Chi^2 = 0.85$ , df = 2 (P = 0.65), I<sup>2</sup> = 0%

# A.7 Parent training interventions aimed at reducing and managing behaviour that challenges

### A.7.1 Parent training versus any control

#### Figure 82: Targeted behaviour that challenges (severity) – post-treatment

	Pare	nt Train	ing	Any control			:	Std. Mean Difference		Std. M	lean Diffe	erence	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% Cl		IV, R	andom, 9	5% CI	
Reitzel 2013	34.7	24.2	6	56.7	30	6	1.9%	-0.75 [-1.93, 0.44]					
Bagner 2007	9.31	9.42	10	15.33	8.74	12	3.4%	-0.64 [-1.50, 0.22]	-				
Hand 2012	2.56	1.32	16	3.85	1.52	13	4.1%	-0.89 [-1.66, -0.12]	_	-			
Oliva 2012	0.78	0.19	14	0.83	0.28	14	4.4%	-0.20 [-0.95, 0.54]				-	
Roberts 2006	49.65	24.54	17	67.2	27.36	15	4.7%	-0.66 [-1.38, 0.05]					
McIntyre 2008	56.33	10.45	21	60.43	14.23	23	6.3%	-0.32 [-0.92, 0.28]					
Roux 2013	10.7	5.4	28	16.45	5.8	24	6.6%	-1.01 [-1.60, -0.43]	-	•	-		
Sofronoff 2011	12.57	8.18	26	15.3	7.04	27	7.3%	-0.35 [-0.90, 0.19]			-+-		
Whittingham 2009	11.21	6.77	29	18.82	8.32	30	7.3%	-0.99 [-1.53, -0.45]	-	•	-		
Tellegen 2013	14.04	8.82	35	15.46	6.08	29	8.4%	-0.18 [-0.68, 0.31]		-			
Plant 2007	11.48	6.71	50	13.46	8.89	24	8.5%	-0.26 [-0.75, 0.23]			-+-		
Leung 2013	9.85	7.28	42	11.36	7.02	39	9.9%	-0.21 [-0.65, 0.23]		-			
Aman 2009	1.23	1.36	55	1.68	1.36	40	10.8%	-0.33 [-0.74, 0.08]		-			
Kleefman 2014	17.28	5.64	102	17.93	5.34	94	16.3%	-0.12 [-0.40, 0.16]					
Total (95% CI)			451			390	100.0%	-0.41 [-0.58, -0.24]			◆		
Heterogeneity: Tau <sup>2</sup> =	0.02; CI	⊢	<u> </u>			<u> </u>							
Test for overall effect:	Z = 4.76	δ (P < 0.	00001)						-2	-1	0	1	2
			- /						Pa	rent Trai	ning Any	control	

#### Figure 83: Targeted behaviour that challenges (severity) – follow-up

	Paren	t Train	ing	Any	Any control Std. Mean Diffe				ce Std. Mean Difference					
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% C	I	IV, Ra	ndom, 9	5% CI		
3.2.1 26 week follow-	up													
Tellegen 2013	13.39	8.3	35	14.01	7.02	29	18.8%	-0.08 [-0.57, 0.41]						
Kleefman 2014	17.31	5.62	100	18.01	5.12	91	56.3%	-0.13 [-0.41, 0.15]		-				
Subtotal (95% CI)			135			120	75.1%	-0.12 [-0.36, 0.13]			$\bullet$			
Heterogeneity: Tau <sup>2</sup> =	0.00; Ch	i² = 0.0	3, df =	1 (P = 0	).86); l	<sup>2</sup> = 0%								
Test for overall effect:	Z = 0.93	(P = 0.	35)											
3.2.2 52 week follow-	up													
Aman 2009	1.84	1.46	51	2.12	1.87	36	24.9%	-0.17 [-0.60, 0.26]						
Subtotal (95% CI)			51			36	24.9%	-0.17 [-0.60, 0.26]						
Heterogeneity: Not app	olicable													
Test for overall effect:	Z = 0.78	(P = 0.	44)											
Total (95% CI)			186			156	100.0%	-0.13 [-0.34, 0.08]						
Heterogeneity: Tau <sup>2</sup> =	0.00; Ch	i² = 0.0	7, df =	2 (P = 0	).96); l	<sup>2</sup> = 0%			H					
Test for overall effect:				•	,.				-2	-1 Descent Train	0	1	2	
Test for subgroup diffe			,	= 1 (P =	= 0.84)	, l² = 0º	%			Parent Train	ng Any	control		

#### Figure 84: Targeted behaviour that challenges (severity, non-improvement) – posttreatment

	Parent Tra	ining	Anycor	ntrol		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Bagner 2007	3	10	10	12	1.6%	0.36 [0.14, 0.96]	←───
Roberts 2006	8	17	12	15	4.8%	0.59 [0.33, 1.03]	<b>←−</b> −−−†
Tellegen 2013	15	29	22	26	9.6%	0.61 [0.41, 0.90]	← <b></b>
Plant 2007	23	50	21	24	12.4%	0.53 [0.38, 0.74]	◀=
Whittingham 2009	18	29	24	30	12.4%	0.78 [0.55, 1.09]	
Roux 2013	18	28	21	24	13.9%	0.73 [0.54, 1.01]	
Leung 2013	26	42	38	39	21.2%	0.64 [0.50, 0.81]	← ■
Sofronoff 2011	20	26	26	27	24.1%	0.80 [0.64, 1.00]	
Total (95% CI)		231		197	100.0%	0.67 [0.59, 0.77]	•
Total events	131		174				
Heterogeneity: Tau <sup>2</sup> =	0.00; Chi <sup>2</sup> =	8.05, df	= 7 (P = 0	.33); l²	= 13%		
Test for overall effect:	Z = 6.09 (P <	< 0.0000	1)				0.5 0.7 1 1.5 2 Parent Training Any control

### Figure 85: Targeted behaviour that challenges (frequency) – post-treatment

	Paren	nt Train	ing	Any	/ contro	bl	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	CI IV, Random, 95% CI
Bagner 2007	100.63	26.22	10	143.14	30.33	12	5.5%	-1.43 [-2.39, -0.47]	·
Roberts 2006	0.15	0.25	17	0.36	0.31	15	8.1%	-0.73 [-1.45, -0.01]	
Roux 2013	118.86	22.26	28	141.2	20.72	24	10.3%	-1.02 [-1.60, -0.44]	· · · · · · · · · · · · · · · · · · ·
Whittingham 2009	121.4	25.28	29	148.63	30.33	30	11.1%	-0.96 [-1.50, -0.42]	· · · · · · · · · · · · · · · · · · ·
Sofronoff 2011	125.15	31.43	26	130.33	34.87	27	11.1%	-0.15 [-0.69, 0.39]	
Plant 2007	17.51	15.61	50	28.77	16.49	24	11.9%	-0.70 [-1.20, -0.20]	
Tellegen 2013	134.24	29.29	35	136.18	27.03	29	12.0%	-0.07 [-0.56, 0.42]	
Leung 2013	112.48	19.64	42	118.59	22.97	39	13.2%	-0.28 [-0.72, 0.15]	
Kleefman 2014	113.85	28.03	102	120.51	24.55	94	16.8%	-0.25 [-0.53, 0.03]	·
Total (95% CI)			339			294	100.0%	-0.54 [-0.80, -0.28]	◆
Heterogeneity: Tau <sup>2</sup> =	0.09; Chi	<sup>2</sup> = 18.6	3, df =	8 (P = 0.	02); I² =	57%			
Test for overall effect:	Z = 4.01	(P < 0.0	001)						Parent Training Any control

### Figure 86: Targeted behaviour that challenges (frequency) – follow-up

	Parer	nt Train	ing	Any	/ contro	ы	5	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	I IV, Random, 95% CI
3.6.1 26 week follow-	up								
Tellegen 2013	126.43	31.01	35	137.24	28.64	29	24.4%	-0.36 [-0.85, 0.14]	
Kleefman 2014	114.37	27.94	100	118.07	2.77	94	75.6%	-0.18 [-0.47, 0.10]	
Subtotal (95% CI)			135			123	100.0%	-0.23 [-0.47, 0.02]	$\bullet$
Heterogeneity: Tau <sup>2</sup> =	0.00; Chi	<sup>2</sup> = 0.35	, df = 1	(P = 0.5	5); l² = (	0%			
Test for overall effect:	Z = 1.80	(P = 0.0	7)						
Total (95% CI)			135			123	100.0%	-0.23 [-0.47, 0.02]	•
Heterogeneity: Tau <sup>2</sup> =	0.00; Chi	<sup>2</sup> = 0.35	, df = 1	(P = 0.5	5); l² = (	0%			
Test for overall effect:	Z = 1.80	(P = 0.0	7)						-2 -1 0 1 Parent Training Any control
Test for subgroup diffe	erences: N	lot appl	icable						Parent Training Any control

### Figure 87: Targeted behaviour that challenges (frequency, non-improvement) – followup

	Parent Tra	aining	Anycor	ntrol		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Bagner 2007	5	10	11	12	4.3%	0.55 [0.29, 1.04]	←
Plant 2007	19	50	19	24	10.1%	0.48 [0.32, 0.72]	←───
Roux 2013	17	28	24	24	17.7%	0.62 [0.46, 0.83]	<b>←-</b>
Whittingham 2009	19	29	30	30	21.7%	0.66 [0.51, 0.86]	
Leung 2013	24	42	39	39	22.3%	0.58 [0.44, 0.75]	<b>←</b> ∎──
Tellegen 2013	21	29	24	26	24.0%	0.78 [0.61, 1.01]	
Total (95% CI)		188		155	100.0%	0.63 [0.55, 0.73]	•
Total events	105		147				
Heterogeneity: Tau <sup>2</sup> =	0.00; Chi <sup>2</sup> =	5.68, df	= 5 (P = 0	).34); l²	= 12%		
Test for overall effect:	Z = 6.62 (P	< 0.0000	1)				0.5 0.7 1 1.5 2 Parent Training Any control

### Figure 88: Adaptive functioning (communication) – post-treatment

	Pare	Parent Training			vcontro	bl	:	Std. Mean Difference	Std. Mean Difference			
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Rando	m, 95% Cl		
Aman 2009	-63.9	22.65	75	-53.57	20.23	49	100.0%	-0.47 [-0.84, -0.11]		1		
Total (95% CI)			75			49	100.0%	-0.47 [-0.84, -0.11]	-			
Heterogeneity: Not ap Test for overall effect:		(P = 0.	01)						-2 -1 C Any control	) 1 Parent Train	2 ning	

### Figure 89: Adaptive functioning (global) – post-treatment

	Parent Training Anycontrol					Std. Mean Difference	Std. Mean Difference					
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Rar	ndom, 95% Cl	
Reitzel 2013	62.7	6.8	7	63.3	5.7	4	8.2%	-0.08 [-1.31, 1.14]	-		<u> </u>	
Aman 2009	57.87	19.03	75	47.84	15.81	49	91.8%	0.56 [0.19, 0.93]				
Total (95% CI)			82			53	100.0%	0.51 [0.15, 0.86]			-	
Heterogeneity: Tau <sup>2</sup> = Test for overall effect				1 (P = 0	.33); l²	= 0%			-2	-1 Any cont	0 1 rol Parent Tra	2 aining

#### Individual parent training versus group parent training A.7.2

### Figure 90: Targeted behaviour that challenges (severity) – post-treatment

	Individual Group						:	Std. Mean Difference		Std. Mea	n Diffe	rence	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Rand	om, 95	5% CI	
Chadwick 2001	2.5	2.7	23	3.7	3.6	15	100.0%	-0.38 [-1.04, 0.28]			+		
Total (95% CI)			23			15	100.0%	-0.38 [-1.04, 0.28]					
Heterogeneity: Not ap Test for overall effect:		(P =	0.26)						-2	-1 Individua	0 I Grou	1 up	2

### Figure 91: Targeted behaviour that challenges (severity) – follow-up

	Ind	ividu	al	G	roup	)	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
4.2.1 26 week follow	-up								
Chadwick 2001 Subtotal (95% CI)	2.2	2.3	23 23	2.3	1.9	15 15	100.0% 100.0%	-0.05 [-0.70, 0.61] -0.05 [-0.70, 0.61]	-
Heterogeneity: Not ap Test for overall effect:		(P =	0.89)						
Test for subgroup diffe	erences:	Not a	pplicat	ble				-2	-1 0 1 2 Individual Group

### Figure 92: Targeted behaviour that challenges (frequency) – post-treatment

	Ind	ividu	al	G	roup	)		Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Chadwick 2001	4.6	2.2	18	5.5	3	13	100.0%	-0.34 [-1.06, 0.38]	
Total (95% CI)			18			13	100.0%	-0.34 [-1.06, 0.38]	
Heterogeneity: Not ap									-2 -1 0 1 2
Test for overall effect:	Z = 0.93	(P =	0.35)						Individual Group

### Figure 93: Targeted behaviour that challenges (frequency) – follow-up

	Ind	ividu	al	G	roup	)	:	Std. Mean Difference	Std. Mean Difference	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI	
4.4.1 26 week follow	-up									
Chadwick 2001 Subtotal (95% CI)	4.2	2.2	18 18	3.9	2.6	13 13	100.0% 100.0%	0.12 [-0.59, 0.84] 0.12 [-0.59, 0.84]		
Heterogeneity: Not ap Test for overall effect:		(P =	0.74)							
									-2 -1 0 1	
Test for subgroup diff		Nata	maliaak						Individual Group	

Test for subgroup differences: Not applicable

### A.7.3 Parent training plus optimism training versus parent training alone

### Figure 94: Targeted behaviour that challenges (severity) – post-treatment

	Parent + Optimism T			Pare	nt T o	nly	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Durand 2013	17.5	10.5	18	25.8	9.7	17	100.0%	-0.80 [-1.49, -0.11]	
Total (95% CI) Heterogeneity: Not ap Test for overall effect:		= 0.02)	18			17	100.0%	-0.80 [-1.49, -0.11] 	-2 -1 0 1 2 ent + Optimism T Parent T only

### Figure 95: Targeted behaviour that challenges (severity) – follow-up

	Parent + Optimism T					Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Durand 2013	5	18	11	17	100.0%	0.43 [0.19, 0.98]	·
Total (95% CI)		18		17	100.0%	0.43 [0.19, 0.98]	
Total events	5		11				
Heterogeneity: Not ap Test for overall effect:		4)				Pa	0.5 0.7 1 1.5 2 arent + Optimism T Parent T only

### Figure 96: Carer satisfaction – follow-up

Parent + Optimism T				Pare	nt T o	nly	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Durand 2013	4.59	0.71	18	4.43	0.71	17	100.0%	0.22 [-0.44, 0.89]	
Total (95% CI)			18			17	100.0%	0.22 [-0.44, 0.89]	
Heterogeneity: Not ap Test for overall effect:		= 0.52)							-2 -1 0 1 2 Parent T only Parent + Optimism T

### A.7.4 Enhanced parent training (SSTP) versus standard parent training (SSTP)

### Figure 97: Targeted behaviour that challenges (severity) – post-treatment

	Enhanced Standard							Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Plant 2007	11.25	6.92	24	11.69	6.52	26	100.0%	-0.06 [-0.62, 0.49]	
Total (95% CI)			24			26	100.0%	-0.06 [-0.62, 0.49]	-
Heterogeneity: Not ap Test for overall effect:		(P = (	0.82)						-2 -1 0 1 2 Enhanced Standard

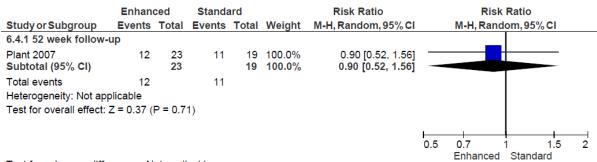
#### Figure 98: Targeted behaviour that challenges (severity) – follow-up

	En	hance	d	Sta	andaro	ł	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
6.2.1 52 week follow	/-up								
Plant 2007	9.91	6.09	23	13.42	6.17	19	100.0%	-0.56 [-1.18, 0.06]	
Subtotal (95% CI)			23			19	100.0%	-0.56 [-1.18, 0.06]	
Heterogeneity: Not ap	oplicable								
Test for overall effect	Z = 1.78	8 (P = 0	0.08)						
								-2	· · · · · · · · · · · · · · · · · · ·
								-2	Enhanced Standard
Test for subgroup diff	erences:	Not ap	oplicabl	е					

#### Figure 99: Targeted behaviour that challenges (severity, non-improvement) – posttreatment

	Enhan	ced	Standa	ard		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Plant 2007	13	24	10	26	100.0%	1.41 [0.77, 2.59]	
Total (95% CI)		24		26	100.0%	1.41 [0.77, 2.59]	
Total events	13		10				
Heterogeneity: Not ap	plicable					ł	
Test for overall effect:	Z = 1.10 (	P = 0.2	7)				0.5 0.7 1 1.5 2 Enhanced Standard

### Figure 100: Targeted behaviour that challenges (severity, non-improvement) – followup



Test for subgroup differences: Not applicable

### Figure 101: Targeted behaviour that challenges (frequency) – post-treatment

	En	hance	b	Sta	andaro	b	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Plant 2007	17.81	15.95	24	17.24	15.3	26	100.0%	0.04 [-0.52, 0.59]	
Total (95% CI)			24			26	100.0%	0.04 [-0.52, 0.59]	-
Heterogeneity: Not ap	plicable							I	-2 $-1$ $0$ $1$ $2$
Test for overall effect:	Z = 0.13	(P = 0.	90)						Enhanced Standard

### Figure 102: Targeted behaviour that challenges (frequency) – follow-up

6.7.1 52 week follow-up	an s	D Tot	al Mear	n SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI	
							,		
Plant 2007 10									
1 10111 2007 10	.07 8.	17 2	3 9.7 <sup>.</sup>	8.09	19	100.0%	0.04 [-0.56, 0.65]		
Subtotal (95% CI)		2	3		19	100.0%	0.04 [-0.56, 0.65]		
Heterogeneity: Not applica	ble								
Test for overall effect: Z =	0.14 (P	= 0.89)							
							H H		-
							-	Enhanced Standard	4

Test for subgroup differences: Not applicable

### Figure 103: Targeted behaviour that challenges (frequency, non-improvement) – posttreatment

	Enhan	ced	Standa	ard		Risk Ratio		Risk Ratio		
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H	l, Random, 95% C	1	
Plant 2007	8	24	11	26	100.0%	0.79 [0.38, 1.62]	←		_	
Total (95% CI)		24		26	100.0%	0.79 [0.38, 1.62]				
Total events	8		11							
Heterogeneity: Not ap	plicable						0.5 0.7		.5	2
Test for overall effect:	Z = 0.65 (	P = 0.5	2)					anced Standard		2

### Figure 104: Targeted behaviour that challenges (frequency, non-improvement) – follow-up

	Enhan	ced	Standa	ard		Risk Ratio		Risk	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Rand	om, 95% Cl	
6.9.1 52 week follow-	·up									
Plant 2007 Subtotal (95% CI)	8	23 23	4	19 <b>19</b>	100.0% <b>100.0%</b>	1.65 [0.59, 4.65] 1.65 [0.59, 4.65]				
Total events	8		4							
Heterogeneity: Not ap	plicable									
Test for overall effect:	Z = 0.95 (	P = 0.3	4)							
							<u> </u>		ļ	
Toot for outparents diffe							0.5	0.7 Enhanced	1 1.5 Standard	

Test for subgroup differences: Not applicable

### Figure 105: Carer satisfaction – post-treatment

	En	hance	d	Sta	ndard	1		Std. Mean Difference		Std. N	lean Diffe	erence	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, R	andom, 9	5% CI	
Plant 2007	-75.5	9.18	24	-73.75	9.89	26	100.0%	-0.18 [-0.74, 0.38]		_			
Total (95% CI)			24			26	100.0%	-0.18 [-0.74, 0.38]					
Heterogeneity: Not ap Test for overall effect:		+ (P = (	0.53)						-2	-1 Enhan	0 ced Sta	1 ndard	2

## A.8 Psychosocial interventions aimed at reducing and managing behaviour that challenges

### A.8.1 Cognitive behavioural interventions versus any control

Figure 106: Targeted behaviour that challenges (severity, family carer rated) – posttreatment

	Cognitive	e- behavi	oural	С	ontrol		:	Std. Mean Difference		Std	Mean D	ifferend	ce	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% Cl		IV,	Random	,95% C	1	
Willner 2013	8.7	18.3	45	12.7	14.7	58	100.0%	-0.24 [-0.63, 0.15]						
Total (95% CI)			45			58	100.0%	-0.24 [-0.63, 0.15]						
Heterogeneity: Not ap Test for overall effect:	•	= 0.22)							-2	-1	С-В С	Control	1	2

### Figure 107: Targeted behaviour that challenges (severity, family carer rated) – followup

	Cognitive	e- behavi	oural	С	ontrol		;	Std. Mean Difference	Sto	I. Mean Differ	ence	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV	, Random, 95%	6 CI	
1.2.1 31 week follow-	up											
Willner 2013	6.5	13.8	42 <b>42</b>	7	15.9	41	100.0% <b>100.0%</b>	-0.03 [-0.46, 0.40]				
Subtotal (95% CI)			42			41	100.0%	-0.03 [-0.46, 0.40]				
Heterogeneity: Not app	olicable											
Test for overall effect: 2	Z = 0.15 (P =	= 0.88)										
									-2 -1	ò	1	2
										C-B Contr	ol	
Test for subgroup diffe	rences: Not	applicable	9									

### Figure 108: Targeted behaviour that challenges (severity, non-improvement, paid carer rated) – post-treatment

	Cognitive- behav	ioural	Contr	ol		<b>Risk Ratio</b>	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
Taylor 2005	9	18	15	20	100.0%	0.67 [0.39, 1.13]	
Total (95% CI)		18		20	100.0%	0.67 [0.39, 1.13]	
Total events	9		15				
Heterogeneity: Not ap Test for overall effect:	·						0.5 0.7 1 1.5 2 C-B Control

#### Figure 109: Targeted behaviour that challenges (severity, paid carer rated) – posttreatment

	Cognitiv	e- behavi	oural	С	ontrol		\$	Std. Mean Difference	Sto	I. Mean Differe	ence	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV	, Random, 95%	6 CI	
Taylor 2005	4.69	4.03	16	6.75	6.42	20	31.6%	-0.37 [-1.03, 0.30]	-			
Willner 2013	10	14.8	76	8.3	12.2	82	68.4%	0.13 [-0.19, 0.44]				
Total (95% CI)			92			102	100.0%	-0.03 [-0.48, 0.42]		•		
Heterogeneity: Tau <sup>2</sup> = Test for overall effect:	· · · · · · · · · · · · · · · · · · ·		1 (P = 0	).19); l²	= 42%				<b>⊢</b> -2 -1	0 C-B Contr	1 0	2

### Figure 110: Targeted behaviour that challenges (severity, paid carer rated) – follow-up

	Cognitive	e- behavi	oural	с	ontrol			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
1.6.1 17 week follow-u	р								
Taylor 2005	4.37	5.78	16	7.25	6.33	20	32.2%	-0.46 [-1.13, 0.20]	
Subtotal (95% CI)			16			20	32.2%	-0.46 [-1.13, 0.20]	
Heterogeneity: Not appli	icable								
Test for overall effect: Z	= 1.36 (P =	= 0.17)							
1.6.2 31 week follow-u	р								
Willner 2013	5.6	12.2	74	5.2	12.1	66	67.8%	0.03 [-0.30, 0.36]	
Subtotal (95% CI)			74			66	67.8%	0.03 [-0.30, 0.36]	<b>•</b>
Heterogeneity: Not appli	icable								
Test for overall effect: Z	= 0.19 (P =	= 0.85)							
Total (95% CI)			90			86	100.0%	-0.13 [-0.58, 0.33]	-
Heterogeneity: Tau <sup>2</sup> = 0	.05; Chi <sup>2</sup> =	1.69, df =	1 (P = 0	.19); I <sup>2</sup>	= 41%			I	
Test for overall effect: Z									-2 -1 0 1 C-B Control
Test for subgroup differe	ences: Chi <sup>2</sup>	= 1.69, d	f = 1 (P =	= 0.19),	<sup>2</sup> = 41	.0%			C-B Control

### Figure 111: Targeted behaviour that challenges (frequency, family carer rated) – posttreatment

	Cognitive	e- behavio	oural	С	ontrol			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Singh 2013	5.35	2.13	17	10.18	2.79	17	100.0%	-1.90 [-2.73, -1.07]	
<b>Total (95% CI)</b> Heterogeneity: Not ap	nlicable		17			17	100.0%	-1.90 [-2.73, -1.07]	
Test for overall effect:	•	< 0.00001)	)						-2 -1 0 1 2 C-B Control

### Figure 112: Targeted behaviour that challenges (frequency, family carer rated) – follow-up

	Cognitive	e- behavio	oural	C	ontrol			Std. Mean Difference	Std	I. Mean Difference	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV	, Random, 95% Cl	
1.8.1 12 week follow-up	)										
Singh 2013	2.47	1.15	17	6.46	1.8	17	100.0%	-2.58 [-3.52, -1.64]	←		
Subtotal (95% CI)			17			17	100.0%	-2.58 [-3.52, -1.64]			
Heterogeneity: Not appli	cable										
Test for overall effect: Z	= 5.40 (P <	< 0.00001)									
1.8.2 24 week follow-up	<b>b</b>										
Singh 2013	1.06	1.04	17	3.7	1.76	17	100.0%	-1.78 [-2.59, -0.97]			
Subtotal (95% CI)			17			17	100.0%	-1.78 [-2.59, -0.97]			
Heterogeneity: Not appli	cable										
Test for overall effect: Z	= 4.32 (P <	< 0.0001)									
									-2 -1		2
									2 -1	C-B Control	2

Test for subgroup differences: Chi<sup>2</sup> = 1.59, df = 1 (P = 0.21), I<sup>2</sup> = 37.1%

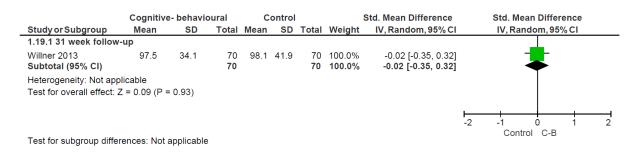
### Figure 113: Adaptive functioning (paid carer rated) – post-treatment

	Cognitiv	ve- behavi	oural	C	ontrol		Std. Mean Difference			Std. Mean Difference			
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Ra	andom, 9	5% CI	
Nezu 1991	-53.17	13.42	18	-74.9	19.99	10	100.0%	1.32 [0.46, 2.18]					
Total (95% CI)			18			10	100.0%	1.32 [0.46, 2.18]					
Heterogeneity: Not ap Test for overall effect:	•	= 0.003)							-2	-1 Cor	0 Itrol C-E	1 3	2

### Figure 114: Quality of life – post-treatment

	Cognitive	- behavi	oural	С	ontrol		Std. Mean Difference			Std. Mean Difference			
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Ra	ndom, 98	5% CI	
Willner 2013	94.3	40.2	62	99.9	31.3	67	100.0%	-0.16 [-0.50, 0.19]		-			
<b>Total (95% CI)</b> Heterogeneity: Not app Test for overall effect: 2		• 0.38)	62			67	100.0%	-0.16 [-0.50, 0.19]	-2	-1 Cont	0 rol C-B	1	2

### Figure 115: Quality of life – follow-up

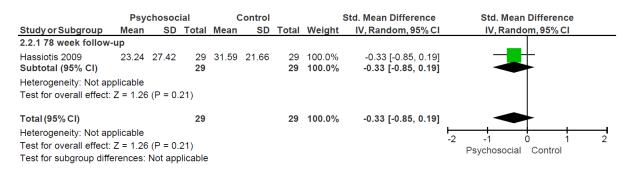


### A.8.2 Behavioural therapy versus any control

Figure 116: Targeted behaviour that challenges (severity, family carer rated) – posttreatment

	Psy	chosoc	ial	c	Control		:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Hassiotis 2009	32.23	27.64	31	45.77	29.02	30	100.0%	-0.47 [-0.98, 0.04]	╶─╋╌┤
Total (95% CI)			31			30	100.0%	-0.47 [-0.98, 0.04]	-
Heterogeneity: Not ap Test for overall effect:		? (P = 0.	07)					I	-2 -1 0 1 2 Psychosocial Control

### Figure 117: Targeted behaviour that challenges (severity, family carer rated) – followup



## A.9 Sleep interventions aimed at reducing and managing behaviour that challenges

### A.9.1 Sleep interventions versus any control

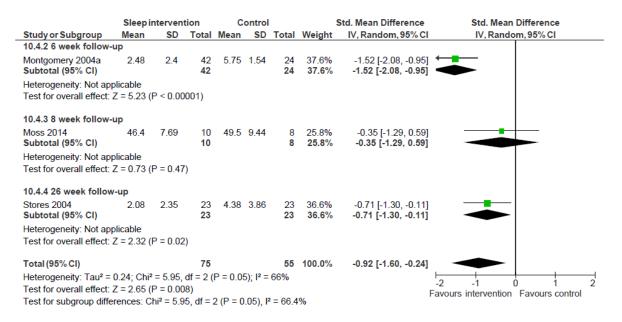
### Figure 118: Targeted behaviour that challenges (global problem sleep behaviour, nonimprovement) – post-treatment

	Sleep interve	ention	Contr	ol		Risk Ratio		Risk	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Rand	lom, 95% Cl	
Cortesi 2012	5	35	21	34	100.0%	0.23 [0.10, 0.54]	t			
Total (95% CI)		35		34	100.0%	0.23 [0.10, 0.54]	_			
Total events	5		21							
Heterogeneity: Not ap	plicable						0.5	0.7	1 1.5	- 2
Test for overall effect:	Z = 3.36 (P = 0	(8000.							Favours control	-

### Figure 119: Targeted behaviour that challenges (global problem sleep behaviour) – post-treatment

	Sleepi	nterven	tion	С	ontrol			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Moss 2014	46.5	7.29	12	51.12	6.51	10	18.6%	-0.64 [-1.50, 0.23]	
Wiggs 1999	2.96	2.24	15	6.29	2.7	15	20.9%	-1.31 [-2.10, -0.51]	← ∎────
Johnson 2013	4.47	2.9	15	6.28	2.68	18	25.0%	-0.63 [-1.34, 0.07]	
Cortesi 2012	47.84	2.94	35	54.78	6.22	34	35.5%	-1.42 [-1.95, -0.89]	
Total (95% CI)			77			77	100.0%	-1.05 [-1.48, -0.63]	◆
Heterogeneity: Tau <sup>2</sup> =	0.06; Chi <sup>2</sup>	= 4.39,	df = 3 (	P = 0.2	2);  ² =	32%			
Test for overall effect:	Z = 4.84 (	P < 0.00	0001)						-2 -1 0 1 2 Favours intervention Favours control

### Figure 120: Targeted behaviour that challenges (global problem sleep behaviour) – follow-up



### Figure 121: Targeted behaviour that challenges (positive sleep behaviour, actigraph) – post-treatment

	Sleepi	interven	tion	c	Control			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
10.5.1 Total sleep tin	ne								
Johnson 2013	460	60	13	434	90	14	29.2%	0.33 [-0.43, 1.09]	<b></b>
Cortesi 2012 Subtotal (95% CI)	505.01	31.18	35 48	481.1	33.15	34 48	70.8% 100.0%	0.73 [0.25, 1.22] 0.62 [0.20, 1.03]	
Heterogeneity: Tau <sup>2</sup> =	0.00; Chi	<sup>2</sup> = 0.78,	df = 1 (	P = 0.38	3); I <sup>2</sup> = 0	%			
Test for overall effect:	Z = 2.94 (	(P = 0.00	3)						
10.5.2 Sleep efficien	су								
Johnson 2013	85	6	13	86	10	14	34.5%	-0.12 [-0.87, 0.64]	<b></b>
Cortesi 2012 Subtotal (95% CI)	84.46	4.23	35 48	82.71	4	34 48	65.5% 100.0%	0.42 [-0.06, 0.90] 0.24 [-0.26, 0.74]	
Heterogeneity: Tau <sup>2</sup> =	0.04; Chi	<sup>2</sup> = 1.38,	df = 1 (	P = 0.24	1); l <sup>2</sup> = 2	8%			
Test for overall effect:	Z = 0.92 (	P = 0.36	)						
									-2 -1 0 1 2
									Favours control Favours intervention

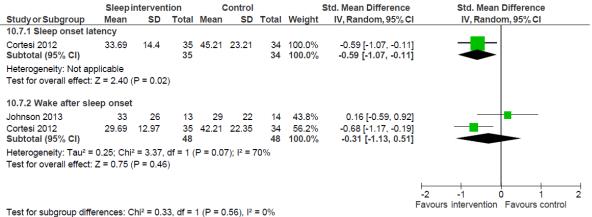
Test for subgroup differences: Chi<sup>2</sup> = 1.33, df = 1 (P = 0.25), I<sup>2</sup> = 24.8%

Challenging behaviour and learning disabilities

### Figure 122: Targeted behaviour that challenges (positive sleep behaviour, actigraph) follow-up

	Sleepi	ntervent	tion	C	ontrol			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
10.6.2 26 week follow	v-up; Tota	l sleep t	ime						
Stores 2004	448.69	73.3	23	437.14	93.3	23	100.0%	0.14 [-0.44, 0.71]	— <b>—</b> —
Subtotal (95% CI)			23			23	100.0%	0.14 [-0.44, 0.71]	
Heterogeneity: Not ap	plicable								
Test for overall effect:	Z = 0.46 (I	P = 0.65	)						
10.6.4 26 week follow	/-up: Sleej	p efficie	ncy						
Stores 2004	74.25	6.88	23	75.03	6.59	23	100.0%	-0.11 [-0.69, 0.46]	<b></b>
Subtotal (95% CI)			23			23	100.0%	-0.11 [-0.69, 0.46]	
Heterogeneity: Not ap	plicable								
Test for overall effect:	Z = 0.39 (I	P = 0.70	)						
									Favours control Favours intervention
Test for subgroup diffe	erences: C	hi² = 0.3	6, <b>df</b> = 1	I (P = 0.5	55), I <sup>2</sup> :	= 0%			

### Figure 123: Targeted behaviour that challenges (problem sleep behaviour, actigraph) post-treatment



### Figure 124: Targeted behaviour that challenges (problem sleep behaviour, actigraph) follow-up

I Mean SD	- Mainha IV Dandana 05% Cl IV Dandana 05	
	al Weight IV, Random, 95% Cl IV, Random, 95	% CI
onset		
3 143.48 39.03 3	3 100.0% 0.29 [-0.29, 0.88] 3 100.0% 0.29 [-0.29, 0.88]	
		1
		-2 -1 0 Favours intervention Favo

Test for subgroup differences: Not applicable

### Figure 125: Targeted behaviour that challenges (positive sleep behaviour, sleep diary) – post-treatment

	Sleepir	nterven	tion	Co	ontro	d i		Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	SD Total		n SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
10.9.1 Total sleep tim	ie								
Wiggs 1999 Subtotal (95% CI)	564	36	15 <b>15</b>	576	42	15 15		-0.30 [-1.02, 0.42] -0.30 [-1.02, 0.42]	
Heterogeneity: Not ap	plicable								
Test for overall effect:	Z = 0.81 (F	P = 0.42	2)						
									-2 -1 0 1 2
Test for subgroup diffe	erences: No	ot applic	able						Favours control Favours intervention

### Figure 126: Targeted behaviour that challenges (problem sleep behaviour, sleep diary) – post-treatment

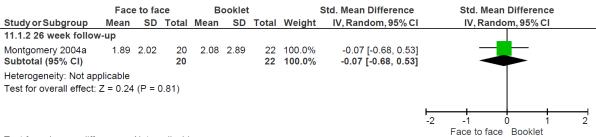
	Sleepir	nterven	tion	C	ontro	) I		Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
10.10.5 Activity score	е								
Wiggs 1999	1.4	0.9	15	1.2	0.4	15	100.0%	0.28 [-0.44, 1.00]	
Subtotal (95% CI)			15			15	100.0%	0.28 [-0.44, 1.00]	
Heterogeneity: Not ap	plicable								
Test for overall effect:	Z = 0.76 (F	P = 0.45	5)						
								-2	-1 0 1 2
Test for subgroup diffe	erences: N	ot applie	cable					Favo	ours intervention Favours control

### Figure 127: Carer satisfaction (non-satisfied) – post-treatment

	Sleepinterve	ention	Contr	ol		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Johnson 2013	1	13	2	17	100.0%	0.65 [0.07, 6.45]	
Total (95% CI)		13		17	100.0%	0.65 [0.07, 6.45]	
Total events	1		2				
Heterogeneity: Not ap	plicable						
Test for overall effect:	Z = 0.36 (P = 0	).72)				1	0.05 0.2 1 5 20 Favours intervention Favours control

### A.9.2 Face-to-face sleep intervention versus booklet only sleep intervention

### Figure 128: Targeted behaviour that challenges (sleep problem behaviour) - follow-up

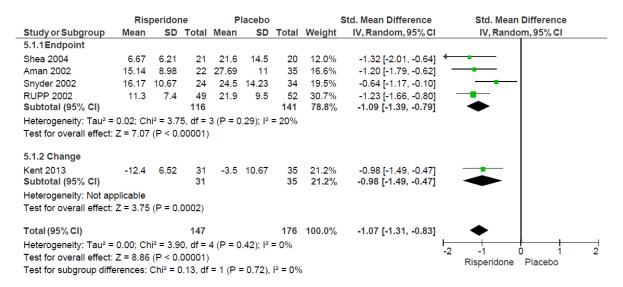


Test for subgroup differences: Not applicable

# A.10 Pharmacological interventions aimed at reducing and managing behaviour that challenges

### A.10.1 Risperidone versus placebo in children and young people

### Figure 129: Targeted behaviour that challenges (severity) - post-treatment



### Figure 130: Targeted behaviour that challenges (severity, non-improvement) – posttreatment

	Risperio	lone	Place	bo		Risk Ratio	Risk Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl	
Shea 2004	10	24	22	28	44.8%	0.53 [0.32, 0.88]	<b></b>	
RUPP 2002	15	49	46	52	55.2%	0.35 [0.22, 0.53]	←	
Total (95% CI)		73		80	100.0%	0.42 [0.28, 0.64]		
Total events	25		68					
Heterogeneity: Tau <sup>2</sup> =	0.03; Chi <sup>2</sup>	= 1.58,	df = 1 (P	= 0.21)	; l² = 37%		0.5 0.7 1 1.5	2
Test for overall effect:	Z = 4.07 (F	o < 0.00	01)				0.5 0.7 1 1.5 Risperidone Placebo	2

### Figure 131: Adaptive functioning (social) - post-treatment

	Risperidone Placebo						:	Std. Mean Difference	Std. Mean Difference		
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, F	Random, 95% Cl	
Shea 2004	14.63	3.83	21	11.13	4.16	20	29.6%	0.86 [0.22, 1.50]		<b>-</b> _	
Aman 2002	13.87	4.24	22	8.9	3.73	35	33.4%	1.25 [0.66, 1.83]		-	
Snyder 2002	12.79	4.25	24	10.33	5.11	33	37.0%	0.51 [-0.03, 1.04]			
Total (95% CI)			67			88	100.0%	0.86 [0.42, 1.30]		-	•
• •	eterogeneity: Tau <sup>2</sup> = 0.06; Chi <sup>2</sup> = 3.34, df = 2 (P = 0.19); l <sup>2</sup> = 40% st for overall effect: Z = 3.86 (P = 0.0001)										2 one

### Figure 132: Adverse events (elevated prolactin, non-occurrence) – post-treatment

	Risperio	lone	Place	bo		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
Aman 2002	48	55	62	63	38.7%	0.89 [0.80, 0.99]	
Snyder 2002	49	53	57	57	61.3%	0.92 [0.85, 1.01]	-
Total (95% CI)		108		120	100.0%	0.91 [0.85, 0.97]	◆
Total events	97		119				
Heterogeneity: Tau <sup>2</sup> =	0.00; Chi <sup>2</sup>	= 0.39,	df = 1 (P	= 0.53)	; I² = 0%	H	0.5 0.7 1 1.5 2
Test for overall effect:	Z = 2.82 (F	P = 0.00	5)			U	Placebo Risperidone

### Figure 133: Adverse events (prolactin-related adverse event; oligomenorrhea, nonoccurrence) – post-treatment

	Risperio	lone	Place	bo		Risk Ratio		Risk	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Rando	om, 95% Cl	
Kent 2013	30	31	35	35	100.0%	0.97 [0.89, 1.05]			·	
Total (95% CI)		31		35	100.0%	0.97 [0.89, 1.05]		-	•	
Total events	30		35							
Heterogeneity: Not ap	plicable							07	15	_
Test for overall effect:	Z = 0.77 (F	P = 0.44	)				0.5	Placebo	I 1.5 Risperidone	2

### Figure 134: Adverse events (prolactin level; ng/ml) – post-treatment

	Risp	Pla	Placebo			Std. Mean Difference		Std. Mean Difference			
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Random, 95% CI	
Snyder 2002	27.9	7.7	33	7	3.6	36	32.8%	3.49 [2.73, 4.25]			•
Aman 2002	27.1	6.2	41	8.4	1.6	53	32.9%	4.35 [3.60, 5.11]			•
RUPP 2002	39	19.2	42	10.1	8.8	36	34.2%	1.87 [1.33, 2.41]		· · · · · · · · · · · · · · · · · · ·	
Total (95% CI)			116			125	100.0%	3.22 [1.68, 4.75]			
Heterogeneity: Tau <sup>2</sup> =	1.72; Ch	ni² = 30		5							
Test for overall effect:	Z = 4.10	(P < (	0.0001)						-2	Risperidone Placebo	2

#### Figure 135: Adverse events (weight; kg) – post-treatment

	Ris	perido	ne	PI	acebo		9	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
3.4.1 Change									
Kent 2013	2.4	2.07	31	0.7	1.19	35	22.5%	1.01 [0.50, 1.53]	<b>_</b>
RUPP 2002	2.7	2.9	49	0.8	2.2	52	36.6%	0.74 [0.33, 1.14]	
Aman 2002 Subtotal (95% CI)	2.2	1.8	52 1 <b>32</b>	0.9	1.5	63 1 <b>50</b>	41.0% 100.0%	0.79 [0.40, 1.17] 0.82 [0.57, 1.06]	
Heterogeneity: Tau <sup>2</sup> =	0.00; Cl	ni² = 0.	73, df =	= 2 (P =	0.70);	l <sup>2</sup> = 0%	6		
Test for overall effect:	Z = 6.57	′ (P < (	0.00001	1)					
3.4.2Endpoint									
Shea 2004	32.8	12.6	25	28.4	9.8	28	100.0%	0.39 [-0.16, 0.93]	+
Subtotal (95% CI)			25			28	100.0%	0.39 [-0.16, 0.93]	
Heterogeneity: Not ap	plicable								
Test for overall effect:	Z = 1.39	) (P = (	0.16)						
								-2	-1 0 1
								-	Risperidone Placebo

Test for subgroup differences:  $Chi^2 = 2.01$ , df = 1 (P = 0.16), l<sup>2</sup> = 50.2%

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	Risperio	lone	Place	bo		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% CI
Shea 2004	22	24	28	28	19.6%	0.92 [0.80, 1.05]	
Aman 2002	44	52	62	63	26.4%	0.86 [0.76, 0.97]	
Snyder 2002	49	53	57	57	54.0%	0.92 [0.85, 1.01]	
Total (95% CI)		129		148	100.0%	0.91 [0.85, 0.96]	•
Total events	115		147				
Heterogeneity: Tau <sup>2</sup> = 0.00; Chi <sup>2</sup> = 1.07, df = 2 (P = 0.5					; I² = 0%	ŀ	0.5 0.7 1 1.5 2
Test for overall effect:	Z = 3.16 (F	P = 0.00	2)			(	Placebo Risperidone

### Figure 136: Adverse events (weight gain, non-occurrence) – post-treatment

### Figure 137: Adverse events (somnolence/sedation, non-occurrence) – post-treatment

	Risperio	lone	Place	bo		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% CI
Shea 2004	11	40	36	39	13.4%	0.30 [0.18, 0.50]	•
Kent 2013	14	31	33	35	17.5%	0.48 [0.32, 0.71]	←──
RUPP 2002	25	49	45	51	22.3%	0.58 [0.43, 0.77]	←∎───
Aman 2002	27	55	57	63	22.9%	0.54 [0.41, 0.72]	<b>←</b>
Snyder 2002	31	53	46	57	23.9%	0.72 [0.56, 0.94]	
Total (95% CI)		228		245	100.0%	0.53 [0.42, 0.68]	
Total events	108		217				
Heterogeneity: Tau <sup>2</sup> =	0.05; Chi <sup>2</sup>	= 10.80	6				
Test for overall effect:	Z = 5.08 (F	P < 0.00	001)				0.5 0.7 1 1.5 2 Placebo Risperidone

### Figure 138: Adverse events (seizure, non-occurrence) – post-treatment

	Risperio	lone	Place	bo		<b>Risk Ratio</b>		Risk	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Rand	om, 95% Cl	
RUPP 2002	49	49	51	52	100.0%	1.02 [0.97, 1.08]				
Total (95% CI)		49		52	100.0%	1.02 [0.97, 1.08]			•	
Total events	49		51							
Heterogeneity: Not ap	plicable						0.5	0.7		2
Test for overall effect:	Z = 0.68 (F	P = 0.50	)				0.5	Placebo	Risperidone	2

### Figure 139: Adverse events (discontinuation due to adverse events, non-occurrence) – post-treatment

	Risperio	lone	Place	bo		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
Shea 2004	26	27	27	28	11.2%	1.00 [0.90, 1.11]	
Kent 2013	30	31	34	35	16.0%	1.00 [0.91, 1.09]	-+-
Aman 2002	53	55	63	63	32.0%	0.96 [0.91, 1.02]	
RUPP 2002	49	49	51	52	40.8%	1.02 [0.97, 1.08]	<b>†</b>
Total (95% Cl)		162		178	100.0%	0.99 [0.96, 1.03]	•
Total events	158		175				
Heterogeneity: Tau <sup>2</sup> =	0.00; Chi <sup>2</sup>	= 1.91,	df = 3 (P	ł			
Test for overall effect:	Z = 0.30 (F	P = 0.76	)				0.5 0.7 1 1.5 2 Placebo Risperidone

### Figure 140: Adverse events (discontinuation due to other reasons, non-occurrence) – post-treatment

	Risperidone		Place	bo		Risk Ratio		<b>Risk Ratio</b>		
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95%		% CI	
Kent 2013	26	31	28	35	16.7%	1.05 [0.84, 1.31]			-	
Snyder 2002	47	53	38	57	18.6%	1.33 [1.08, 1.64]				
Aman 2002	45	55	44	63	18.9%	1.17 [0.95, 1.44]		+		
RUPP 2002	46	49	35	52	19.2%	1.39 [1.14, 1.71]		<u> </u>	-	
Shea 2004	26	27	25	28	26.6%	1.08 [0.93, 1.25]		- <b>+</b>		
Total (95% Cl)		215		235	100.0%	1.19 [1.06, 1.34]		•	•	
Total events	190		170							
Heterogeneity: Tau <sup>2</sup> =	0.01; Chi <sup>2</sup>	= 6.88,	df = 4 (P	= 0.14)	; I² = 42%		0.5 (	07 1	1.5	
Test for overall effect:	Z = 3.00 (F		0.5 (		ridone	1				

### A.10.2 Withdrawal of risperidone versus continuation of risperidone in children and young people

### Figure 141: Targeted behaviour that challenges (relapse) – post-treatment

	WD Risper	idone	Risperio	fone		Risk Ratio		Risk	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Fixed, 95% Cl		M-H, Fixe	d, 95% Cl	
RUPP 2005	10	16	2	16	100.0%	5.00 [1.30, 19.30]				-
Total (95% CI)		16		16	100.0%	5.00 [1.30, 19.30]				_
Total events	10		2					76	10	
Heterogeneity: Not ap	plicable						5.0	0.7	10	-
Test for overall effect:	Z = 2.34 (P =	0.02)					WD	Risperidone	Risperidone	- 4

### A.10.3 Aripiprazole versus placebo in children and young people

#### Figure 142: Targeted behaviour that challenges (severity) – post-treatment

	Aripi	prazol	le	Pla	aceb	0	\$	Std. Mean Difference	Sto	d. Mean Di	ifference	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% Cl	IV	/, Random	n, 95% CI	
Owen 2009	-12.9	9.5	46	-5	9.8	49	38.7%	-0.81 [-1.23, -0.39]	_	<b>-</b>		
Marcus 2009	-13.33	9.24	164	-8.4	9.8	49	61.3%	-0.52 [-0.85, -0.20]				
Total (95% CI)			210			98	100.0%	-0.64 [-0.91, -0.36]		◆		
Heterogeneity: Tau <sup>2</sup> =	0.00; Chi	<sup>2</sup> = 1.1	3, df =	1 (P =	0.29)	; l² = 12	2%		-2 -1		1	
Test for overall effect:	Z = 4.54 (	(P < 0.	00001	)						prazole F	Placebo	2

### Figure 143: Targeted behaviour that challenges (severity, non-improvement) – posttreatment

	Aripipra	zole	Place	bo		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Owen 2009	22	46	42	49	43.3%	0.56 [0.40, 0.77]	←
Marcus 2009	78	164	32	49	56.7%	0.73 [0.56, 0.94]	
Total (95% CI)		210		98	100.0%	0.65 [0.50, 0.84]	
Total events	100		74				
Heterogeneity: Tau <sup>2</sup> =	0.01; Chi <sup>2</sup>	= 1.59,	df = 1 (P	= 0.21)	; l² = 37%		0.5 0.7 1 1.5 2
Test for overall effect:	Z = 3.27 (F	P = 0.00	1)				Aripiprazole Placebo

### Figure 144: Quality of life – post-treatment

	Ari	piprazo	le	P	lacebo			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Owen 2009	13.4	11.08	34	2	11.24	39	47.7%	1.01 [0.52, 1.50]	
Marcus 2009	14.12	15.5	133	10.6	15.82	37	52.3%	0.23 [-0.14, 0.59]	+ <b>-</b> -
Total (95% CI)			167			76	100.0%	0.60 [-0.17, 1.37]	
Heterogeneity: Tau <sup>2</sup> = Test for overall effect				1 (P = 0	0.01); l²	= 84%			-2 -1 0 1 2 Placebo Aripiprazole

### Figure 145: Adverse events (elevated prolactin, non-occurrence) – post-treatment

	Aripipra	zole	Place	bo		<b>Risk Ratio</b>	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
Owen 2009	46	47	47	50	36.3%	1.04 [0.96, 1.13]	
Marcus 2009	165	165	49	51	63.7%	1.05 [0.98, 1.11]	-
Total (95% CI)		212		101	100.0%	1.05 [0.99, 1.10]	•
Total events	211		96				
Heterogeneity: Tau <sup>2</sup> =	0.00; Chi <sup>2</sup>	= 0.01,	df = 1 (P	= 0.91)	; I² = 0%		0.5 0.7 1 1.5 2
Test for overall effect:	Z = 1.76 (F	° = 0.08	)				Placebo Aripiprazole

### Figure 146: Adverse events (weight gain; kg) – post-treatment

	Arip	oiprazo	ole	PI	acebo			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Marcus 2009	1.37	2.22	165	0.3	2.14	51	100.0%	0.48 [0.17, 0.80]	
Total (95% CI)			165			51	100.0%	0.48 [0.17, 0.80]	◆
Heterogeneity: Not ap Test for overall effect:			0.003)						-2 -1 0 1 2 Aripiprazole Placebo

### Figure 147: Adverse events (weight gain; clinically significant, non-occurrence) – post-treatment

	Aripipra	zole	Place	bo		<b>Risk Ratio</b>		Risk	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Rand	om, 95% Cl	
Owen 2009	33	47	47	50	26.6%	0.75 [0.61, 0.91]		<b>—</b>		
Marcus 2009	123	165	47	51	73.4%	0.81 [0.72, 0.91]				
Total (95% CI)		212		101	100.0%	0.79 [0.71, 0.88]		•		
Total events	156		94							
Heterogeneity: Tau <sup>2</sup> = Test for overall effect:	,	· · · ·		= 0.49)	; I² = 0%		0.5	0.7 Placebo	1 1.5 Aripiprazole	2

### Figure 148: Adverse events (sedation, non-occurrence) – post-treatment

	Aripiprazole Placebo			oo		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% CI
Owen 2009	39	47	48	50	37.4%	0.86 [0.75, 1.00]	
Marcus 2009	126	165	48	51	62.6%	0.81 [0.73, 0.90]	
Total (95% CI)		212		101	100.0%	0.83 [0.76, 0.91]	•
Total events	165		96				
Heterogeneity: Tau <sup>2</sup> =	0.00; Chi <sup>2</sup>	= 0.48,	df = 1 (P	= 0.49)	; I² = 0%	H	5 07 1 15 2
Test for overall effect:	Z = 4.21 (F	o < 0.00	01)			U.	5 0.7 1 1.5 2 Placebo Aripiprazole

### Figure 149: Adverse events (seizure, non-occurrence) – post-treatment

	Aripipra	zole	Place	bo		<b>Risk Ratio</b>		Risk Ra	tio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Random	, 95% CI	
Marcus 2009	165	165	50	51	100.0%	1.03 [0.98, 1.08]				
Total (95% CI)		165		51	100.0%	1.03 [0.98, 1.08]		•		
Total events	165		50							
Heterogeneity: Not ap	plicable							07 1	1.5	-
Test for overall effect:	Z = 1.08 (F	P = 0.28	3)				0.5	Placebo Ar	ipiprazole	2

### Figure 150: Adverse events (discontinuation due to adverse events, non-occurrence) – post-treatment

	Aripipra	zole	Place	bo		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% Cl
Owen 2009	42	47	48	51	37.9%	0.95 [0.84, 1.07]	
Marcus 2009	149	166	48	52	62.1%	0.97 [0.89, 1.07]	
Total (95% CI)		213		103	100.0%	0.96 [0.89, 1.04]	•
Total events	191		96				
Heterogeneity: Tau <sup>2</sup> = Test for overall effect:				= 0.76)	; I² = 0%		0.5 0.7 1 1.5 2 Placebo Aripiprazole

### Figure 151: Adverse events (discontinuation due to other reasons, non-occurrence) – post-treatment

	Aripipra	zole	Place	bo		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Marcus 2009	157	166	42	52	60.3%	1.17 [1.02, 1.34]	
Owen 2009	44	47	39	51	39.7%	1.22 [1.03, 1.45]	<b> </b> −− <b>■</b> −−
Total (95% Cl)		213		103	100.0%	1.19 [1.07, 1.33]	•
Total events	201		81				
Heterogeneity: Tau <sup>2</sup> =	0.00; Chi <sup>2</sup>	= 0.16,	df = 1 (P	= 0.69)	; I² = 0%		0.5 0.7 1 1.5 2
Test for overall effect:	Z = 3.22 (F	P = 0.00	1)				Placebo Aripiprazole

### A.10.4 Aripiprazole versus risperidone in children and young people

### Figure 152: Targeted behaviour that challenges (severity) – post-treatment

	Aripiprazole			Risperidone				Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% Cl
Ghanizadeh 2013	14.6	5.5	29	12.5	5.4	30	100.0%	0.38 [-0.14, 0.90]	
Total (95% CI)			29			30	100.0%	0.38 [-0.14, 0.90]	-
Heterogeneity: Not ap Test for overall effect:		(P = (	D.15)						-2 -1 0 1 2 Aripiprazole Risperidone

### Figure 153: Adverse events (drowsiness, non-occurrence) – post-treatment

	Aripipra	zole	Risperio	done		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Ghanizadeh 2013	23	29	25	30	100.0%	0.95 [0.74, 1.22]	
Total (95% CI)		29		30	100.0%	0.95 [0.74, 1.22]	-
Total events	23		25				
Heterogeneity: Not ap	plicable						0.5 0.7 1 1.5 2
Test for overall effect:	Z = 0.40 (F	P = 0.69	)				Risperidone Aripiprazole

#### Figure 154: Adverse events (seizure, non-occurrence) – post-treatment

	Aripipra	zole	Risperie	done		<b>Risk Ratio</b>	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% CI
Ghanizadeh 2013	29	29	29	30	100.0%	1.03 [0.94, 1.13]	
Total (95% CI)		29		30	100.0%	1.03 [0.94, 1.13]	•
Total events	29		29				
Heterogeneity: Not ap Test for overall effect:		P = 0.49	)				0.5 0.7 1 1.5 2 Risperidone Aripiprazole

### Figure 155: Adverse events (discontinuation due to adverse events, non-occurrence) – post-treatment

	Aripipra	zole	Risperie	done		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% CI
Ghanizadeh 2013	29	29	29	30	100.0%	1.03 [0.94, 1.13]	-
Total (95% CI)		29		30	100.0%	1.03 [0.94, 1.13]	•
Total events	29		29				
Heterogeneity: Not ap Test for overall effect:	•	P = 0.49	)				0.5 0.7 1 1.5 2 Risperidone Aripiprazole

### Figure 156: Adverse events (discontinuation due to other reasons, non-occurrence) – post-treatment

	Aripipra	zole	Risperio	done		Risk Ratio			Risk	Ratio		
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		Μ	-H, Rand	dom, 95% Cl		
Ghanizadeh 2013	27	29	28	30	100.0%	1.00 [0.87, 1.14]			-	-		
Total (95% CI)		29		30	100.0%	1.00 [0.87, 1.14]						
Total events	27		28									
Heterogeneity: Not ap Test for overall effect:		P = 0.97	)				0.5	0		1 1.5		2
rest for overall effect.	2 - 0.01 (i	0.01	,					Risp	eridone	Aripiprazole	е	

### A.10.5 Withdrawal of aripiprazole versus continuation of aripiprazole in children and young people

### Figure 157: Targeted behaviour that challenges (relapse) – post-treatment

	WD Aripipr	azole	Aripipra	zole		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Fixed, 95% Cl	M-H, Fixed, 95% Cl
Findling 2014	23	44	14	41	100.0%	1.53 [0.92, 2.55]	<b>_</b> →
Total (95% CI)		44		41	100.0%	1.53 [0.92, 2.55]	
Total events	23		14				22 CT 12 CT
Heterogeneity: Not ap	plicable						0.5 0.7 1 1.5 2
Test for overall effect:	Z = 1.64 (P =	0.10)					WD Aripiprazole Aripiprazole

### A.10.6 Olanzapine versus haloperidol in children and young people

### Figure 158: Targeted behaviour that challenges (severity) – post-treatment

	Ola	nzapir	ne	Hal	operid	lol		Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Malone 2001	2.17	0.83	6	3.33	0.69	6	100.0%	-1.40 [-2.73, -0.08]	←
Total (95% CI)			6			6	100.0%	-1.40 [-2.73, -0.08]	
Heterogeneity: Not ap Test for overall effect:	· · · · · · · · · · · · · · · · · · ·	8 (P = (	0.04)						-2 -1 0 1 2 Olanzapine Haloperidol

### Figure 159: Adverse events (drowsiness, non-occurrence) – post-treatment

	Olanza	pine	Halope	ridol		Risk Ratio			Risk	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		Μ	-H, Rand	om, 95% Cl	
Malone 2001	1	6	4	6	100.0%	0.25 [0.04, 1.63]	+				
Total (95% CI)		6		6	100.0%	0.25 [0.04, 1.63]					
Total events	1		4								
Heterogeneity: Not ap Test for overall effect:		P = 0.1	5)				0.5	0 Hal	.7 operidol	1 1.5 Olanzapine	2

### Figure 160: Adverse events (weight gain; kg) – post-treatment

	Olanzapine			Hale	operid	ol		Std. Mean Difference		Std. Mea	an Differe	nce	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Ran	dom, 95%	CI	
Malone 2001	4.08	1.59	6	1.45	2.22	6	100.0%	1.26 [-0.03, 2.54]				-	<b>—</b> )
Total (95% CI)			6			6	100.0%	1.26 [-0.03, 2.54]					
Heterogeneity: Not ap Test for overall effect:	•	(P = (	0.06)						-2	-1 Olanzapin	0 le Halope	1 eridol	2

### Figure 161: Adverse events (weight gain) – post-treatment

	Olanza	pine	Halope	ridol		Risk Ratio		R	sk Ra	tio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Ra	ndom	n, 95% CI	
Malone 2001	5	6	6	6	100.0%	0.85 [0.55, 1.31]	_		H		
Total (95% CI)		6		6	100.0%	0.85 [0.55, 1.31]					
Total events	5		6								
Heterogeneity: Not ap Test for overall effect:		P = 0.4	5)				0.5	0.7 Olanzapi	1 ne H	1.5 aloperidol	2

### A.10.7 Topiramate (plus risperidone) versus placebo (plus risperidone) in children and young people

### Figure 162: Targeted behaviour that challenges (severity) – post-treatment

	Тор	irama	te	PI	acebo	•		Std. Mean Difference		S	td. M	ean	Differen	ice	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI			IV, Ra	Indo	m, 95% (	CI	
Rezaei 2010	8.2	2.44	20	15.3	4.64	20	100.0%	-1.88 <b>[</b> -2.63, -1.12]							
Total (95% Cl)			20			20	100.0%	-1.88 [-2.63, -1.12]							
Heterogeneity: Not ap Test for overall effect:		′ (P < (	0.00001	1)					-2	To	<mark>∔</mark> ∙1 piram		) Placebo	1	2

### Figure 163: Adverse events (sedation, non-occurrence) – post-treatment

	Topiran	nate	Place	bo		Risk Ratio		Ris	sk Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Rai	ndom, 95% Cl	
Rezaei 2010	19	20	16	20	100.0%	1.19 [0.93, 1.51]				
Total (95% CI)		20		20	100.0%	1.19 [0.93, 1.51]				
Total events	19		16							
Heterogeneity: Not ap Test for overall effect:	•	P = 0.16	6)				0.5	0.7 Placeb	1 1.5 o Topiramate	2

### Figure 164: Adverse events (weight at endpoint) – post-treatment

	Тор	irama	te	PI	acebo	,	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Rezaei 2010	26.32	6.35	20	27.92	6.56	20	100.0%	-0.24 [-0.87, 0.38]	
Total (95% CI)			20			20	100.0%	-0.24 [-0.87, 0.38]	-
Heterogeneity: Not ap Test for overall effect:			0.44)					H	2 -1 0 1 2 Topiramate Placebo

### A.10.8 Valproate versus placebo in children and young people

### Figure 165: Targeted behaviour that challenges (severity) – post-treatment

	Va	proat	е	P	lacebo		\$	Std. Mean Difference		Std. Me	an Diffe	erence	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Rar	dom, 9	5% CI	
Hollander 2010	14.5	6.67	16	17.7	7.94	11	47.8%	-0.43 [-1.21, 0.35]					
Hellings 2005	18.17	8.79	16	15.45	10.39	14	52.2%	0.28 [-0.44, 1.00]		-	╌┼═╸		
Total (95% Cl)			32			25	100.0%	-0.06 [-0.75, 0.63]				-	
Heterogeneity: Tau <sup>2</sup> =	0.10; Cł	ni² = 1.	71, df =	= 1 (P =	0.19); l <sup>a</sup>	² = 41%	, D		-2	-1	-	1	
Test for overall effect:	Z = 0.17	' (P = 0	0.86)						-2	Valproa	te Pla	cebo	

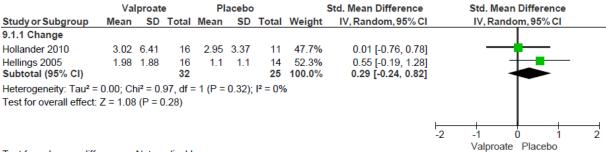
### Figure 166: Targeted behaviour that challenges (severity, non-improvement) – posttreatment

	Valpro	ate	Place	bo		Risk Ratio		Ris	k Ratio		
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Ran	dom, 95% Cl		
Hollander 2010	6	16	10	11	100.0%	0.41 [0.21, 0.80]	•				
Total (95% CI)		16		11	100.0%	0.41 [0.21, 0.80]					
Total events	6		10								
Heterogeneity: Not ap	plicable						L	0.7	<u>+</u>	-	-
Test for overall effect:	Z = 2.63 (	P = 0.0	09)				0.5	0.7 Valproate	1 1. Placebo	5	2

### Figure 167: Targeted behaviour that challenges (severity) – post-treatment

	N-acetylc	ysteine (I	NAC)	Pla	aceb	0	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% Cl
Hardan 2012	7.2	5.7	14	13.1	9.9	15	100.0%	-0.70 [-1.46, 0.05]	
Total (95% CI)			14			15	100.0%	-0.70 [-1.46, 0.05]	
Heterogeneity: Not ap Test for overall effect:		0.07)						N-ace	-2 -1 0 1 2 etylcysteine (NAC) Placebo

### Figure 168: Adverse events (weight; kg) – post-treatment



Test for subgroup differences: Not applicable

#### Figure 169: Adverse events (weight gain, non-occurrence) – post-treatment

	Valpro	ate	Place	bo		<b>Risk Ratio</b>		Ris	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Rano	dom, 95% Cl	
Hellings 2005	9	16	10	14	100.0%	0.79 [0.46, 1.36]	Ļ			
Total (95% CI)		16		14	100.0%	0.79 [0.46, 1.36]				
Total events	9		10							
Heterogeneity: Not ap	plicable						0.5	0.7	1 1.5	2
Test for overall effect:	Z = 0.86 (	P = 0.3	9)				0.5	Placebo		2

### Figure 170: Adverse events (somnolence/sedation, non-occurrence) – post-treatment

	Valpro	ate	Place	bo		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Hollander 2010	16	16	8	11	48.6%	1.37 [0.94, 1.99]	
Hellings 2005	13	16	11	14	51.4%	1.03 [0.72, 1.48]	
Total (95% CI)		32		25	100.0%	1.19 [0.90, 1.56]	
Total events	29		19				
Heterogeneity: Tau <sup>2</sup> = Test for overall effect:				P = 0.29	9); I² = 129	6	0.5 0.7 1 1.5 2 Placebo Valproate

### Figure 171: Adverse events (discontinuation due to adverse events, non-occurrence) – post-treatment

	Valproa	ate	Placel	bo		Risk Ratio		Risk Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI		M-H, Random, 95% Cl	
Hollander 2010	15	16	11	11	46.2%	0.95 [0.79, 1.15]			
Hellings 2005	15	16	14	14	53.8%	0.94 [0.79, 1.12]			
Total (95% CI)		32		25	100.0%	0.95 [0.83, 1.08]		-	
Total events	30		25						
Heterogeneity: Tau <sup>2</sup> =				P = 0.95	5); I² = 0%		0.5	0.7 1 1.5	2
Test for overall effect:	Z – 0.83 (I	- 0.4	1)					Placebo Valproate	

### Figure 172: Adverse events (discontinuation due to other reasons, non-occurrence) – post-treatment

	Valpro	ate	Place	bo		Risk Ratio		Risk Ratio		
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI		M-H, Random, 95% C	1	
Hollander 2010	15	16	10	11	100.0%	1.03 [0.82, 1.29]				
Total (95% CI)		16		11	100.0%	1.03 [0.82, 1.29]				
Total events	15		10							
Heterogeneity: Not ap	plicable							07 1 1	F	-
Test for overall effect:	Z = 0.27 (	P = 0.7	9)				0.5	0.7 1 1 Placebo Valproate	.5 9	2

### A.10.9 N-acetylcysteine versus placebo in children and young people

### Figure 173: Targeted behaviour that challenges (severity) – post-treatment

	N-acetylcy	/steine (	NAC)	Pla	aceb	0	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Hardan 2012	7.2	5.7	14	13.1	9.9	15	100.0%	-0.70 [-1.46, 0.05]	
Total (95% CI)			14			15	100.0%	-0.70 [-1.46, 0.05]	
Heterogeneity: Not ap Test for overall effect:	•	0.07)						N-ace	-2 -1 0 1 2 etylcysteine (NAC) Placebo

### Figure 174: Adverse events (discontinuation due to adverse events, non-occurrence) – post-treatment

	N-acetylcysteine	(NAC)	Place	bo		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
Hardan 2012	14	15	18	18	100.0%	0.93 [0.78, 1.11]	
Total (95% CI)		15		18	100.0%	0.93 [0.78, 1.11]	-
Total events	14		18				
Heterogeneity: Not ap	plicable						
Test for overall effect:	Z = 0.81 (P = 0.42)						0.5 0.7 1 1.5 2 Placebo N-acetylcysteine (NA

### Figure 175: Adverse events (discontinuation due to other reasons, non-occurrence) – post-treatment

	N-acetylcysteine	(NAC)	Place	bo		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% CI
Hardan 2012	14	15	12	18	100.0%	1.40 [0.98, 1.99]	
Total (95% CI)		15		18	100.0%	1.40 [0.98, 1.99]	
Total events	14		12				
Heterogeneity: Not ap	plicable						05 07 1 15 2
Test for overall effect:	Z = 1.87 (P = 0.06)					N-ac	etylcysteine (NAC) Placebo

## A.10.10 Ginkgo biloba (plus risperidone) versus placebo (plus risperidone) in children and young people

#### Figure 176: Targeted behaviour that challenges (severity) – post-treatment

	Ginkgo biloba Placebo					:	Std. Mean Difference	Std. Mean Difference	
Study or Subgroup	Mean	SD T	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Hasanzadeh 2012	10.54	5.75	23	9.88	7.35	24	100.0%	0.10 [-0.47, 0.67]	
Total (95% CI)			23			24	100.0%	0.10 [-0.47, 0.67]	-
Heterogeneity: Not ap Test for overall effect:		P = 0.7	74)						-2 -1 0 1 2 Ginkgo biloba Placebo

#### Figure 177: Adverse events (drowsiness, non-occurrence) – post-treatment

	Ginkgo I	oiloba	Place	bo		<b>Risk Ratio</b>		Risk	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Fixed, 95% Cl		M-H, Fixe	d, 95% Cl	
Hasanzadeh 2012	17	23	17	24	100.0%	1.04 [0.73, 1.49]				
Total (95% CI)		23		24	100.0%	1.04 [0.73, 1.49]				
Total events Heterogeneity: Not ap	17 nlicable		17				<b>—</b>			
Test for overall effect:	•	9 = 0.81)					0.5	0.7 Placebo	I 1.5 Ginkgo bilo	2 ba

### A.10.11 Omega-3 versus placebo in children and young people

### Figure 178: Targeted behaviour that challenges (severity) – post-treatment

	Om	nega-	3	Pla	acebo	o	:	Std. Mean Difference		Std. M	ean Differe	nce	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Ra	ndom, 95%	CI	
Amminger 2007	24.6	8.7	7	21.8	2.8	5	100.0%	0.37 [-0.79, 1.53]					-
Total (95% CI)			7			5	100.0%	0.37 [-0.79, 1.53]					-
Heterogeneity: Not ap Test for overall effect:		(D -	0.52)						-2	-1	0	1	2
rest for overall effect.	2 - 0.63	(P -	0.55)							Omega	a-3 Placel	00	

### Figure 179: Adverse events (discontinuation due to adverse events, non-occurrence) – post-treatment

	Omega	a-3	Place	bo		<b>Risk Ratio</b>		Risk	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI		M-H, Rand	om <u>, 95</u> % Cl	
Amminger 2007	7	7	5	6	100.0%	1.19 [0.78, 1.83]				-
Total (95% CI)		7		6	100.0%	1.19 [0.78, 1.83]				-
Total events	7		5							
Heterogeneity: Not ap	plicable						0.5	0.7	1 1.5	-
Test for overall effect:	Z = 0.81 (	P = 0.4	2)				0.5	Placebo	Omega-3	2

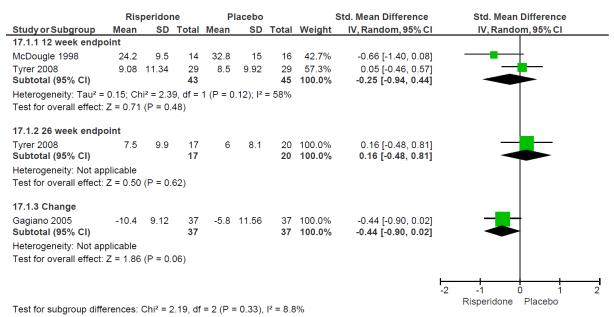
## A.10.12 Piracetam (plus risperidone) vs placebo (plus risperidone) be used in children and young people

#### Figure 180: Adverse events (drowsiness, non-occurrence) – post-treatment

	Piracetam Placebo		bo		Risk Ratio	Risk Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% Cl
Akhondzadeh 2008	13	20	11	20	100.0%	1.18 [0.71, 1.97]	
Total (95% CI)		20		20	100.0%	1.18 [0.71, 1.97]	
Total events	13		11				
Heterogeneity: Not ap Test for overall effect:	•	P = 0.5	2)			н О.	5 0.7 1 1.5 2 Placebo Piracetam

### A.10.13 Risperidone versus placebo in adults

#### Figure 181: Targeted behaviour that challenges (severity) – post-treatment



#### Figure 182: Quality of life – post-treatment

	Ris	peridor	ne	Р	lacebo		;	Std. Mean Difference		Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Random, 95% CI
17.3.1 12 week endp	oint									
Tyrer 2008	73.08	10.83	29	70.2	10.32	29	59.1%	0.27 [-0.25, 0.79]		-+=
Subtotal (95% CI)			29			29	<b>59</b> .1%	0.27 [-0.25, 0.79]		
Heterogeneity: Not ap	plicable									
Test for overall effect:	Z = 1.02	! (P = 0.	31)							
17.3.3 26 week endp	oint									
Tyrer 2008	74.4	11.7	19	71.9	12.9	21	40.9%	0.20 [-0.42, 0.82]		
Subtotal (95% CI)			19			21	40.9%	0.20 [-0.42, 0.82]		
leterogeneity: Not ap	plicable									
Test for overall effect:	Z = 0.63	6 (P = 0.	53)							
Total (95% CI)			48			50	100.0%	0.24 [-0.16, 0.64]		•
Heterogeneity: Tau <sup>2</sup> =	0.00; Ch	ni² = 0.0	3, df =	1 (P = 0	.87); l²	= 0%			<u>ا</u>	<u> </u>
Test for overall effect:	Z = 1.18	(P = 0.	24)	-					-2	-1 0 1 Placebo Risperidone
Test for subgroup diffe	erences:	$Chi^2 = 0$	).03. df	= 1 (P =	= 0.87).	$ ^{2} = 0\%$	, D			Flacebo Risperidone

#### Figure 183: Adaptive functioning (social) - post-treatment

	Ris	perido	ne	PI	acebo	•		Std. Mean Difference		Std. Mea	n Difference	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Rand	dom, 95% Cl	
McDougle 1998	2.54	1.27	14	4	0.79	16	100.0%	-1.36 [-2.17, -0.56]	←			
Total (95% CI)			14			16	100.0%	-1.36 [-2.17, -0.56]				
Heterogeneity: Not ap Test for overall effect:	•		0.0009)	)					-2	-1 Risperidone	0 1 e Placebo	2

### Figure 184: Adverse events (weight gain, non-occurrence) – post-treatment

	Risperio	lone	Place	bo		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Fixed, 95% CI	M-H, Fixed, 95% CI
McDougle 1998	13	15	16	16	100.0%	0.87 [0.69, 1.09]	
Total (95% CI)		15		16	100.0%	0.87 [0.69, 1.09]	
Total events	13		16				
Heterogeneity: Not ap	plicable						05 07 1 15 2
Test for overall effect:	Z = 1.21 (F	P = 0.23	)				0.5 0.7 1 1.5 2 Placebo Risperidone

### Figure 185: Adverse events (somnolence/sedation, non-occurrence) – post-treatment

	Risperio	lone	Place	bo		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
McDougle 1998	6	15	16	16	44.3%	0.42 [0.23, 0.76]	
Gagiano 2005	30	39	32	38	55.7%	0.91 [0.73, 1.14]	
Total (95% CI)		54		54	100.0%	0.65 [0.28, 1.47]	
Total events	36		48				
Heterogeneity: Tau <sup>2</sup> = Test for overall effect:				= 0.009	9); <b>I</b> ² = 85%	6	0.5 0.7 1 1.5 2 Placebo Risperidone

### Figure 186: Adverse events (discontinuation due to adverse events, non-occurrence) – post-treatment

	Risperio	lone	Place	bo		<b>Risk Ratio</b>	Risk	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Rando	om, 95% Cl	
McDougle 1998	13	15	16	16	14.8%	0.87 [0.69, 1.09]			
Tyrer 2008	28	29	29	29	85.2%	0.97 [0.88, 1.06]	-	ŀ	
Total (95% CI)		44		45	100.0%	0.95 [0.87, 1.04]	•	•	
Total events	41		45						
Heterogeneity: Tau <sup>2</sup> =	0.00; Chi <sup>2</sup>	= 0.92,	df = 1 (P	= 0.34)	; I² = 0%		0.5 0.7 1	1.5	2
Test for overall effect: 2	Z = 1.13 (F	P = 0.26	)				0.5 0.7 1 Placebo	I 1.5 Risperidone	2

### Figure 187: Adverse events (discontinuation due to other reasons, non-occurrence) – post-treatment

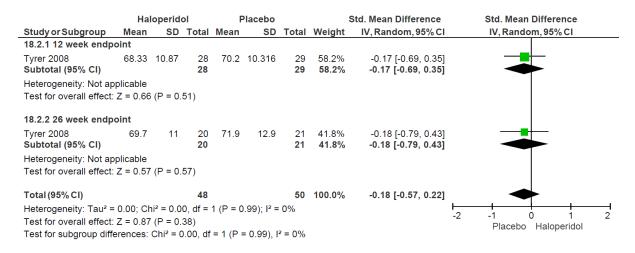
	Risperio	done	Place	bo		<b>Risk Ratio</b>	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% CI
Tyrer 2008	21	29	21	29	15.7%	1.00 [0.73, 1.37]	<b>+</b>
McDougle 1998	14	15	12	16	16.1%	1.24 [0.91, 1.70]	- <b>-</b>
Gagiano 2005	35	39	34	38	68.3%	1.00 [0.86, 1.17]	
Total (95% CI)		83		83	100.0%	1.04 [0.92, 1.18]	•
Total events	70		67				
Heterogeneity: Tau <sup>2</sup> =	0.00; Chi <sup>2</sup>	= 1.54,	df = 2 (P	= 0.46)	; I² = 0%	ŀ	0.5 0.7 1 15 2
Test for overall effect:	Z = 0.58 (F	P = 0.56	)			(	0.5 0.7 1 1.5 2 Placebo Risperidone

### A.10.14 Haloperidol versus placebo in adults

### Figure 188: Targeted behaviour that challenges (severity) – post treatment

	Halo	operid	ol	Р	lacebo		\$	Std. Mean Difference	Std. Mean	Difference	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Rando	om, 95% CI	
18.1.1 12 week endp	oint										
Tyrer 2008	4.38	6.83	28	8.5	9.921	29	58.2%	-0.48 [-1.00, 0.05]		ł	
Subtotal (95% CI)			28			29	58.2%	-0.48 [-1.00, 0.05]	-	t	
Heterogeneity: Not ap	plicable										
Test for overall effect:	Z = 1.77	(P=0	0.08)								
18.1.2 26 week endp	oint										
Tyrer 2008	3.9	8.4	20	6	8.1	20	41.8%	-0.25 [-0.87, 0.37]		<b> </b>	
Subtotal (95% CI)			20			20	41.8%	-0.25 [-0.87, 0.37]			
Heterogeneity: Not ap	plicable										
Test for overall effect:	Z = 0.79	(P = 0	0.43)								
Total (95% CI)			48			49	100.0%	-0.38 [-0.78, 0.02]	•		
Heterogeneity: Tau <sup>2</sup> =	0.00; Ch	ni² = 0.	30, df =	= 1 (P =	0.59); I	<sup>2</sup> = 0%				<u> </u>	
Test for overall effect:	Z = 1.86	(P = (	0.06)						-2 -1 (	J 1 Placebo	
Test for subgroup diffe	arences.	$Chi^2 =$	0 30 0	If = 1 (P	= 0.59	$1^{2} = 0$	%		Haloperidol	Flacebo	

#### Figure 189: Quality of life – post-treatment



#### Figure 190: Adverse events (seizure, non-occurrence) – post-treatment

	Haloperidol Placebo			bo		Risk Ratio	Risk Ratio					
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		Μ	-H, Rand	lom, 95% Cl		
Tyrer 2008	27	28	29	29	100.0%	0.96 [0.88, 1.06]			-			
Total (95% CI)		28		29	100.0%	0.96 [0.88, 1.06]			•			
Total events	27		29									
Heterogeneity: Not ap Test for overall effect:		P = 0.46	5)				0.5		.7 Placebo	1 1.5 Haloperidol	_	

### Figure 191: Adverse events (discontinuation due to adverse events, non-occurrence) post-treatment

	Haloper	ridol	Place	bo		<b>Risk Ratio</b>	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% Cl
Tyrer 2008	26	28	29	29	100.0%	0.93 [0.82, 1.05]	
Total (95% CI)		28		29	100.0%	0.93 [0.82, 1.05]	•
Total events	26		29				
Heterogeneity: Not ap	plicable						0.5 0.7 1 1.5 2
Test for overall effect:	Z = 1.19 (F	P = 0.24	4)				Haloperidol Placebo

### Figure 192: Adverse events (discontinuation due to other reasons, non-occurrence) post-treatment

	Halope	ridol	Place	bo		<b>Risk Ratio</b>	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% CI
Tyrer 2008	23	28	21	29	100.0%	1.13 [0.85, 1.51]	
Total (95% CI)		28		29	100.0%	1.13 [0.85, 1.51]	
Total events	23		21				
Heterogeneity: Not ap	plicable						0.5 0.7 1 1.5 2
Test for overall effect:	Z = 0.87 (F	P = 0.38	3)				Haloperidol Placebo

#### A.10.15 **Risperidone versus haloperidol in adults**

### Figure 193: Targeted behaviour that challenges (severity) – post treatment

	Ris	speridon	e	Hal	operid	lol	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
19.1.1 12 week endp	oint								
Tyrer 2008	9.08	11.339	29	4.38	6.83	28	61.1%	0.49 [-0.03, 1.02]	
Subtotal (95% CI)			29			28	61.1%	0.49 [-0.03, 1.02]	
Heterogeneity: Not ap	plicable								
Test for overall effect:	Z = 1.83	8 (P = 0.0	)7)						
19.1.2 26 week endp	oint								
Tyrer 2008	7.5	9.9	17	3.9	8.4	19	38.9%	0.39 [-0.28, 1.05]	
Subtotal (95% CI)			17			19	38.9%	0.39 [-0.28, 1.05]	
Heterogeneity: Not ap	plicable								
Test for overall effect:	Z = 1.14	+ (P = 0.2	25)						
Total (95% CI)			46			47	100.0%	0.45 [0.04, 0.86]	•
Heterogeneity: Tau <sup>2</sup> =	= 0.00; CI	hi² = 0.06	6, df = 1	(P = 0.	80); l²	= 0%			
Test for overall effect:									-2 -1 0 1
Test for subgroup diff	erences.	$Chi^2 = 0$	06 df =	= 1 (P =	0.80)	$l^2 = 0\%$	6		Risperidone Haloperidol

Test for subgroup differences:  $Chi^2 = 0.06$ , df = 1 (P = 0.80),  $I^2 = 0\%$ 

### Figure 194: Quality of life – post-treatment

	Ris	peridor	ne	Ha	loperid	ol	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
19.4.1 12 week endpo	oint								
Tyrer 2008 Subtotal (95% CI)	73.08	10.83	29 <b>29</b>	68.33	10.87	28 <b>28</b>	59.3% <b>59.3%</b>	0.43 [-0.09, 0.96] <b>0.43 [-0.09, 0.96]</b>	
Heterogeneity: Not ap	•	(5 0							
Test for overall effect:	Z = 1.61	(P = 0.	11)						
19.4.2 26 week endpo	oint								
Tyrer 2008 Subtotal (95% CI)	74.4	11.7	19 <b>19</b>	69.7	11	20 <b>20</b>	40.7% <b>40.7%</b>	0.41 [-0.23, 1.04] <b>0.41 [-0.23, 1.04]</b>	
Heterogeneity: Not ap	plicable								
Test for overall effect:	Z = 1.25	(P = 0.	21)						
Total (95% CI)			48			48	100.0%	0.42 [0.02, 0.83]	•
Heterogeneity: Tau <sup>2</sup> = Test for overall effect: Test for subgroup diffe	Z = 2.04	(P = 0.	04)						-2 -1 0 1 : Haloperidol Risperidone

### Figure 195: Adverse events (seizure, non-occurrence) – post-treatment

	Risperio	done	Halope	ridol		Risk Ratio			Ris	k Ratio			
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI		N	l-H, Ran	dom, 95	5% Cl		
Tyrer 2008	29	29	27	28	100.0%	1.04 [0.94, 1.14]							
Total (95% CI)		29		28	100.0%	1.04 [0.94, 1.14]				•			
Total events	29		27										
Heterogeneity: Not ap Test for overall effect:	•	P = 0.46	)				0.5	-	.7 operidol	1 I Rispe		5 ne	2

### Figure 196: Adverse events (discontinuation due to adverse events, non-occurrence) – post-treatment

	Risperio	lone	Halope	ridol		<b>Risk Ratio</b>	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% Cl
Tyrer 2008	28	29	26	28	100.0%	1.04 [0.92, 1.18]	
Total (95% CI)		29		28	100.0%	1.04 [0.92, 1.18]	-
Total events	28		26				
Heterogeneity: Not ap	plicable						0.5 0.7 1 1.5 2
Test for overall effect:	Z = 0.62 (F	P = 0.54	)				Haloperidol Risperidone

### Figure 197: Adverse events (discontinuation due to other reasons, non-occurrence) – post-treatment

	Risperio	done	Halope	ridol		Risk Ratio		Risk	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI		M-H, Rand	lom, 95% Cl	
Tyrer 2008	23	29	24	28	100.0%	0.93 [0.73, 1.18]			<u> </u>	
Total (95% CI)		29		28	100.0%	0.93 [0.73, 1.18]				
Total events	23		24							
Heterogeneity: Not ap Test for overall effect:		P = 0.53	)				0.5	0.7 Haloperidol	1 1.5 Risperidone	2

### A.10.16 Olanzapine versus risperidone in adults

### Figure 198: Targeted behaviour that challenges (severity) – post treatment

	Olanzapine			anzapine Risperidone			:	Std. Mean Difference	Std. Mean Difference					
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Ra	andom, 9	5% CI		
Amore 2011	6.06	3.03	31	5.45	3.05	31	100.0%	0.20 [-0.30, 0.70]				_		
Total (95% CI)			31			31	100.0%	0.20 [-0.30, 0.70]						
Heterogeneity: Not ap Test for overall effect:	·		0.44)						-2	-1 Olanzap	0 Dine Risp	1 Deridone	2	

### Figure 199: Adverse events (elevated prolactin) – post treatment

	Olanza	pine	Risperie	done		<b>Risk Ratio</b>	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% CI
Amore 2011	22	31	30	31	100.0%	0.73 [0.58, 0.93]	
Total (95% CI)		31		31	100.0%	0.73 [0.58, 0.93]	
Total events	22		30				
Heterogeneity: Not ap Test for overall effect:		P = 0.00	)9)				0.5 0.7 1 1.5 2 Olanzapine Risperidone

### Figure 200: Adverse events (weight gain, non-occurrence) – post-treatment

	Olanza	pine	Risperio	lone		<b>Risk Ratio</b>	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Amore 2011	24	31	28	31	100.0%	0.86 [0.69, 1.07]	
Total (95% CI)		31		31	100.0%	0.86 [0.69, 1.07]	
Total events	24		28				
Heterogeneity: Not ap Test for overall effect:		P = 0.17	7)				0.5 0.7 1 1.5 2 Risperidone Olanzapine

### Figure 201: Adverse events (sedation, non-occurrence) – post-treatment

	Olanza	pine	Risperie	done		<b>Risk Ratio</b>			Risk	Ratio			
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		Μ	-H, Rano	dom, 95	% CI		
Amore 2011	24	31	26	31	100.0%	0.92 [0.72, 1.18]				-			
Total (95% CI)		31		31	100.0%	0.92 [0.72, 1.18]							
Total events	24		26										
Heterogeneity: Not ap Test for overall effect:		P = 0.52	2)				0.5 F	0. Risp	.7 eridone	1 Olanz		5 ie	2

### A.10.17 Lithium versus placebo in adults

### Figure 202: Targeted behaviour that challenges (frequency, non-improvement) – post treatment

	Lithiu	m	Place	bo		<b>Risk Ratio</b>			Risk	Ratio		
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		Μ	-H, Rand	om, 95% (	1	
Craft 1987	6	22	14	20	100.0%	0.39 [0.19, 0.82]	-					
Total (95% CI)		22		20	100.0%	0.39 [0.19, 0.82]						
Total events	6		14									
Heterogeneity: Not ap Test for overall effect:		P = 0.0	1)				0.5	0	l .7 Lithium	1 1 Placebo	.5	2

### A.10.18 Withdrawal of zuclopenthixol versus continuation of zuclopenthixol in adults

### Figure 203: Targeted behaviour that challenges (relapse) – post-treatment

	WDZuclopen	WDZuclopenthixol		thixol		<b>Risk Ratio</b>	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% C	I M-H, Random, 95% CI
Haessler 2007	19	20	12	19	100.0%	1.50 [1.05, 2.15	
Total (95% CI)		20		19	100.0%	1.50 [1.05, 2.15	
Total events	19		12				
Heterogeneity: Not ap Test for overall effect:		03)					0.5 0.7 1 1.5 2 WD Zuclopenthixol

#### Figure 204: Targeted behaviour that challenges (severity, continuous outcome) – posttreatment

	WDZuc	lopenthi	ixol	Zuclo	Zuclopenthixol			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
22.2.1Endpoint									
Haessler 2007	-31.8	6.5	20	-35.6	6.8	19	31.8%	0.56 [-0.08, 1.20]	
Subtotal (95% CI)			20			19	31.8%	0.56 [-0.08, 1.20]	
Heterogeneity: Not appli	icable								
Test for overall effect: Z	= 1.71 (P	P = 0.09)							
22.2.2 Change									
Izmeth 1988	0.4	1.3	40	-0.3	0.7	45	68.2%	0.68 [0.24, 1.11]	
Subtotal (95% CI)			40			45	68.2%	0.68 [0.24, 1.11]	
Heterogeneity: Not appli	icable								
Test for overall effect: Z	= 3.02 (P	P = 0.003	)						
Total (95% CI)			60			64	100.0%	0.64 [0.28, 1.00]	•
Heterogeneity: Tau <sup>2</sup> = 0	.00; Chi² :	= 0.09, d	f = 1 (F	P = 0.77)	; l² = 0	%		F	
Test for overall effect: Z	= 3.46 (P	P = 0.000	5)					-2	2 -1 0 1 D Zuclopenthixol Zuclopenthixol
Test for subgroup differe	rences: Chi <sup>2</sup> = 0.09, df = 1 (			(P = 0.7	7), l² =	0%		VVL	

### Figure 205: Targeted behaviour that challenges (severity, categorical outcome) – posttreatment

	WDZuclopen	thixol	Zuclopen	thixol		Risk Ratio	Risk Ratio
Study or Subgroup	tudy or Subgroup Events		Events	Total	Weight	M-H, Random, 95% C	I M-H, Random, 95% CI
Singh 1992	7	19	5	24	100.0%	1.77 [0.67, 4.70	)] — — — — — — — — — — — — — — — — — — —
Total (95% CI)		19		24	100.0%	1.77 [0.67, 4.70]	]
Total events	7		5				
Heterogeneity: Not ap Test for overall effect:		25)					0.5 0.7 1 1.5 2
rescior overall effect.	z = 1.14 (P = 0.	20)					WD Zuclopenthixol Zuclopenthixol

### Figure 206: Adverse events (weight gain; kg) – post-treatment

	WDZuc	WDZuclopenthixol				ixol	:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, <u>Random, 95%</u> CI
Haessler 2007	-1.2	3.8	20	0.6	2.4	19	100.0%	-0.55 [-1.19, 0.09]	
Total (95% CI)			20			19	100.0%	-0.55 [-1.19, 0.09]	
Heterogeneity: Not ap Test for overall effect:	•	9 = 0.09)	)					-2 -2 WE	2 -1 0 1 2 2 Zuclopenthixol Zuclopenthixol

### Figure 207: Adverse events: (drowsiness, non-occurrence) – post-treatment

	WDZuclopen	thixol	Zuclopen	thixol		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Izmeth 1988	21	22	19	20	100.0%	1.00 [0.88, 1.15]	
Total (95% CI)		22		20	100.0%	1.00 [0.88, 1.15]	+
Total events	21		19				
Heterogeneity: Not ap	plicable						0.5 0.7 1 1.5 2
Test for overall effect:	Z = 0.07 (P = 0.	95)					0.5 0.7 1 1.5 2 Zuclopenthixol WD Zuclopenthixol

### Figure 208: Adverse events (discontinuation due to adverse events, non-occurrence) – post-treatment

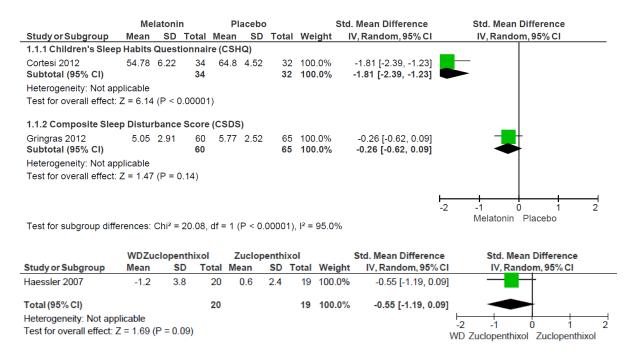
	WDZuclopent			thixol		<b>Risk Ratio</b>	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Singh 1992	19	25	27	27	28.3%	0.76 [0.61, 0.96]	
Izmeth 1988	42	56	53	57	34.7%	0.81 [0.68, 0.95]	
Haessler 2007	19	20	18	19	37.0%	1.00 [0.87, 1.16]	- <b>+</b> -
Total (95% CI)		101		103	100.0%	0.86 [0.71, 1.04]	-
Total events	80		98				
Heterogeneity: Tau <sup>2</sup> =	0.02; Chi <sup>2</sup> = 6.9	5, df = 2	(P = 0.03);	<sup>2</sup> = 71%			
Test for overall effect:	Z = 1.54 (P = 0.1	12)					Zuclopenthixol WD Zuclopenthixol

### Figure 209: Adverse events (discontinuation due to other reasons, non-occurrence) – post-treatment

Study or Subgroup	WDZuclopenthixol Events Total		Zuclopen Events		Weight	Risk Ratio M-H, Random, 95% CI	Risk Ratio M-H. Random. 95% Cl
	Lvents						
Haessler 2007	7	20	13	19	42.1%	0.51 [0.26, 1.00]	
Singh 1992	22	25	25	27	57.9%	0.95 [0.79, 1.14]	
Total (95% CI)		45		46	100.0%	0.73 [0.33, 1.64]	
Total events	29		38				
Heterogeneity: Tau <sup>2</sup> =	0.28: Chi <sup>2</sup> = 5.50	). df = 1	(P = 0.02):	l² = 82%			
Test for overall effect:							0.5 0.7 1 1.5 2 Zuclopenthixol WD Zuclopenthixol

### A.10.19 Melatonin versus placebo in children and young people

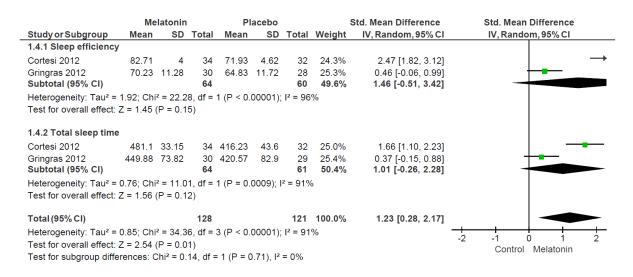
### Figure 210: Targeted behaviour that challenges (global problem sleep behaviour) – post-treatment



#### Figure 211: Targeted behaviour that challenges (global problem sleep behaviour, nonimprovement) – post-treatment

	Melato	nin	Place	bo		<b>Risk Ratio</b>		Risk	Ratio	
Study or Subgroup	udyorSubgroup Events Total Ev		Events	Total	Weight	M-H, Random, 95% CI		M-H, Rand	dom, 95% Cl	
Cortesi 2012	21	34	32	32	100.0%	0.62 [0.48, 0.81]	←			
Total (95% CI)		34		32	100.0%	0.62 [0.48, 0.81]				
Total events	21		32							
Heterogeneity: Not ap	plicable						0.5	0.7	1 15	2
Test for overall effect:	Z = 3.48 (	P = 0.0	005)				0.0	Melatonin	Placebo	2

### Figure 212: Targeted behaviour that challenges (positive sleep behaviour, actigraph) – post-treatment



### Figure 213: Targeted behaviour that challenges (problem sleep behaviour, actigraph) – post-treatment

	M	elatonir	n	PI	acebo			Std. Mean Difference	Std. Mean Differend	ce
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% C	:1
1.5.1 Wake after slee	ep onset									
Gringras 2012	68.42	41.03	24	104.12	59.53	25	43.2%	-0.68 [-1.26, -0.11]		
Cortesi 2012	42.21	22.35	34	70.15	42.76	32	56.8%	-0.82 [-1.32, -0.31]		
Subtotal (95% CI)			58			57	100.0%	-0.76 [-1.14, -0.38]	<b>•</b>	
Heterogeneity: Tau <sup>2</sup> =	0.00; CI	ni² = 0.1	1, df =	1 (P = 0.	74); l² =	0%				
Test for overall effect:	Z = 3.92	2 (P < 0.	0001)							
1.5.2 Sleep onset late	ency								_	
Cortesi 2012	45.21	23.21	34	79.6	31.85	32	100.0%	-1.23 [-1.75, -0.70]		
Subtotal (95% CI)			34			32	100.0%	-1.23 [-1.75, -0.70]		
Heterogeneity: Not ap	plicable									
Test for overall effect:	Z = 4.54	+ (P < 0.	00001)							
			,							
									i i i	!
									-2 -1 0 Melatonin Placebo	1 :
Test for subgroup diffe	erences:	Chi <sup>2</sup> = 1	.97, df	= 1 (P =	0.16), I	<sup>2</sup> = 49.2	2%		Melatonin Placebo	1

#### Figure 214: Targeted behaviour that challenges (positive sleep behaviour, sleep diary) – post-treatment

	Me	latonin	l.	Placebo				Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
1.6.1 Total sleep tim	e								
Braam 2008a	9.44	1.05	29	9.31	1.09	22	43.8%	0.12 [-0.43, 0.67]	<b></b>
Braam 2008b	11.04	0.46	4	9.31	0.28	4	5.0%	3.95 [0.90, 7.00]	
Gringras 2012	571.26	71.98	51	558.03	68.94	59	51.2%	0.19 [-0.19, 0.56]	-+=
Subtotal (95% CI)			84			85	100.0%	0.34 [-0.37, 1.05]	
Heterogeneity: Tau <sup>2</sup> =	= 0.22; Chi	<sup>2</sup> = 5.89	, df = 2	(P = 0.0	5); l² = (	66%			
Test for overall effect	: Z = 0.95	(P = 0.3	4)						
Total (95% CI)			84			85	100.0%	0.34 [-0.37, 1.05]	
Heterogeneity: Tau <sup>2</sup> =	= 0.22; Chi	<sup>2</sup> = 5.89	, df = 2	(P = 0.0	5); I² = (	66%			
Test for overall effect	: Z = 0.95	(P = 0.3	4)						-2 -1 0 1 Control Melatonin
Test for subgroup diff	ferences: N	lot appl	icable						Control Melatorini

### Figure 215: Targeted behaviour that challenges (problem sleep behaviour, sleep diary) – post-treatment

	Me	latonin	1	P	lacebo			Std. Mean Difference		Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Random, 95% CI
1.7.1 Number of wake	es/ night									
Braam 2008b	0.9	0.61	4	1.8	0.79	4	7.0%	-1.11 [-2.69, 0.47]	←	
Braam 2008a	1.29	0.92	28	1.49	1.18	18	35.1%	-0.19 [-0.78, 0.40]		
Gringras 2012	0.8	1.2	51	0.6	1.5	59	57.9%	0.15 [-0.23, 0.52]		
Subtotal (95% CI)			83			81	100.0%	-0.06 [-0.49, 0.37]		-
Heterogeneity: Tau <sup>2</sup> =	0.05; Ch	i² = 2.8	6, df =	2 (P = 0	.24); I <sup>2</sup>	= 30%				
Test for overall effect:	Z = 0.27	(P = 0.	78)							
1.7.2 Wake after slee	p onset									
Braam 2008b	. 17.5	5.74	4	55.75	20.64	4	3.6%	-2.20 [-4.25, -0.15]	←	
Braam 2008a	31.25	34.37	29	50.6	45.8	22	36.0%	-0.48 [-1.04, 0.08]		
Gringras 2012	54.82	51.91	54	92.36	63.02	59	60.5%	-0.64 [-1.02, -0.26]		
Subtotal (95% CI)			87			85	100.0%	-0.64 [-1.03, -0.25]		◆
Heterogeneity: Tau <sup>2</sup> =	0.03; Ch	i² = 2.5	2, df =	2 (P = 0	.28); I <sup>2</sup>	= 21%				
Test for overall effect:	Z = 3.20	(P = 0.	001)							
1.7.3 Duration of wak	es									
Braam 2008b	11.75	9.87	4	60.75	45.02	4	10.7%	-1.31 [-2.96, 0.34]	←	
Braam 2008a	25.17	26.7	27	12.05	12.52	18	38.3%	0.58 [-0.03, 1.19]		<b>⊢</b> ∎
Gringras 2012	16.8	26.3	51	9.7	22.3	59	51.0%	0.29 [-0.09, 0.67]		+∎
Subtotal (95% CI)			82			81	100.0%	0.23 [-0.36, 0.82]		
Heterogeneity: Tau <sup>2</sup> =	0.14; Ch	j <sup>2</sup> = 4.4	5, df =	2 (P = 0	.11); I²	= 55%				
Test for overall effect:	Z = 0.76	(P = 0.4	45)		-					
									-2	-1 0 1
									-2	Melatonin Placebo
Test for subgroup diffe		Chi2 - 7	04 df	- 2 (P -	- 0 03)	12 - 71	60/			

### Figure 216: Adverse events (seizure, non-occurrence) – post-treatment

	Melato	nin	Place	bo		Risk Ratio	Risk Ratio			
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Ran	dom, 95% Cl	
Gringras 2012	70	70	75	76	100.0%	1.01 [0.98, 1.05]				
Total (95% CI)		70		76	100.0%	1.01 [0.98, 1.05]			•	
Total events	70		75							
Heterogeneity: Not ap	plicable						0.5	0.7	1 1.5	2
Test for overall effect:	Z = 0.67 (	P = 0.5	1)				0.5	Placebo		2

### Figure 217: Adverse events (somnolence/sedation, non-occurrence) – post-treatment

	Melato	nin	Place	bo		Risk Ratio	Risk Ratio				
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Ra	ndom,9	5% CI	
Gringras 2012	61	70	66	76	100.0%	1.00 [0.89, 1.14]					
Total (95% CI)		70		76	100.0%	1.00 [0.89, 1.14]			$\bullet$		
Total events	61		66								
Heterogeneity: Not ap	•	D - 0 0	<b>C</b> )				0.5	0.7	1	1.5	2
Test for overall effect:	2 - 0.05 (	P - 0.9	0)					Placel	oo Mela	atonin	

### Figure 218: Adverse events (discontinuation due to adverse events, non-occurrence) – post-treatment

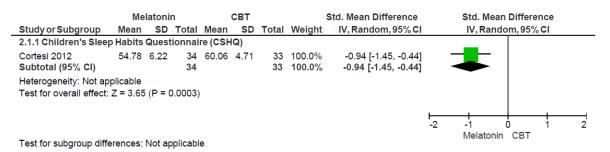
	Melato	nin	Place	bo		Risk Ratio		Risk	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Fixed, 95% Cl		M-H, Fixe	d,95% Cl	
Gringras 2012	69	70	74	76	100.0%	1.01 [0.97, 1.06]				
Total (95% CI)		70		76	100.0%	1.01 [0.97, 1.06]		•		
Total events	69		74							
Heterogeneity: Not app			•				0.5	0.7	1 <u>1.5</u>	2
Test for overall effect:	Z = 0.52 (	P = 0.6	0)					Placebo	Melatonin	

### Figure 219: Adverse events (discontinuation due to other reasons, non-occurrence) – post-treatment

	Melatonin		Place	oo		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% CI
Braam 2008a	29	30	22	28	22.4%	1.23 [1.00, 1.51]	
Cortesi 2012	36	40	34	40	28.9%	1.06 [0.90, 1.25]	
Gringras 2012	65	70	71	76	48.8%	0.99 [0.91, 1.09]	+
Total (95% CI)		140		144	100.0%	1.06 [0.94, 1.20]	•
Total events	130		127				
Heterogeneity: Tau <sup>2</sup> =	0.01; Chi2	= 3.92	, df = 2 (F	e = 0.14	4); l² = 49%	6 H	
Test for overall effect:					-	U	.5 0.7 1 1.5 2 Placebo Melatonin

### A.10.20 Melatonin versus CBT in children and young people

### Figure 220: Targeted behaviour that challenges (global problem sleep behaviour) – post-treatment



### Figure 221: Targeted behaviour that challenges (global problem sleep behaviour, nonimprovement) – post-treatment

	Melato	nin	CBT	г		<b>Risk Ratio</b>	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Fixed, 95% CI	M-H, Fixed, 95% CI
Cortesi 2012	21	34	30	33	100.0%	0.68 [0.51, 0.90]	
Total (95% CI)		34		33	100.0%	0.68 [0.51, 0.90]	•
Total events	21		30				
Heterogeneity: Not ap Test for overall effect:	•	P = 0.0	08)				0.05 0.2 1 5 20 Melatonin CBT

### Figure 222: Targeted behaviour that challenges (problem sleep behaviour, actigraph) – post-treatment

	M	elatonir	ı		СВТ			Std. Mean Difference	Std. Mean Difference	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Fixed, 95% CI	IV, Fixed, 95% CI	
2.4.3 Wake after slee	ep onset									
Cortesi 2012	42.21	22.35	34	61.17	28.93	33	100.0%	-0.73 [-1.22, -0.23]		
Subtotal (95% CI)			34			33	100.0%	-0.73 [-1.22, -0.23]		
Heterogeneity: Not ap	plicable									
Test for overall effect:	Z = 2.87	(P = 0.	004)							
2.4.4 Sleep onset late	ency									
Cortesi 2012	45.21	23.21	34	59.13	27.6	33	100.0%	-0.54 [-1.03, -0.05]		
Subtotal (95% CI)			34			33	100.0%	-0.54 [-1.03, -0.05]		
Heterogeneity: Not ap	plicable									
Test for overall effect:	Z = 2.17	' (P = 0.	03)							
									-2 $-1$ $0$ $1$	
									Melatonin CBT	2

Test for subgroup differences: Chi<sup>2</sup> = 0.28, df = 1 (P = 0.60),  $I^2 = 0\%$ 

### Figure 223: Targeted behaviour that challenges (positive sleep behaviour, actigraph) – post-treatment

	M	elatonir	ı		СВТ			Std. Mean Difference	St	d. Mean	Difference	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Fixed, 95% CI		IV, Fixed	d, 95% Cl	
2.5.1 Total sleep time	e											
Cortesi 2012	481.1	45.07	34	445.13	48.37	33	100.0%	0.76 [0.26, 1.26]				
Subtotal (95% CI)			34			33	100.0%	0.76 [0.26, 1.26]				
Heterogeneity: Not ap	plicable											
Test for overall effect:	Z = 3.00	0 (P = 0.	003)									
2.5.2 Sleep efficiency	/											
Cortesi 2012	82.71	4	34	79.58	2.82	33	100.0%	0.89 [0.39, 1.40]				-
Subtotal (95% CI)			34			33	100.0%	0.89 [0.39, 1.40]				-
Heterogeneity: Not ap	plicable											
Test for overall effect:	Z = 3.47	' (P = 0.	0005)									
									L			
									-2 -1		<u>0</u> 1	2
Test for subgroup diffe	erences:	Chi² = (	).13, df	= 1 (P =	0.72), I	² = 0%				CBT	Melatonin	

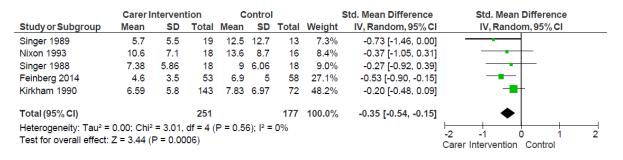
### Figure 224: Adverse events (discontinuation due to other reasons, non-occurrence) – post-treatment

	Melato	nin	Place	bo		Risk Ratio		Risk	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl		M-H, Rand	om, 95% Cl	
Cortesi 2012	36	40	36	40	100.0%	1.00 [0.86, 1.16]		-	-	
Total (95% CI)		40		40	100.0%	1.00 [0.86, 1.16]				
Total events	36		36							
Heterogeneity: Not ap Test for overall effect:		P = 1.0	0)				0.5	0.7 Placebo	1 1.5 Melatonin	2

# A.11 Interventions aimed at improving the health and well-being of carers of people with learning disabilities

### A.11.1 Cognitive behavioural interventions for family carers versus any control

### Figure 225: Carer health and well-being (depression) - post-treatment



### Figure 226: Carer health and well-being (depression) - follow-up

	Carer Ir	nterventi	ion	c	ontrol			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
1.3.1 46 week follow-	up								
Schultz 1993 Subtotal (95% CI)	15.67	9.15	15 <b>15</b>	21.29	13.53	39 <b>39</b>	38.3% <b>38.3%</b>	-0.44 [-1.04, 0.16] <b>-0.44 [-1.04, 0.16]</b>	
Heterogeneity: Not app	plicable								
Test for overall effect:	Z = 1.44 (I	P = 0.15)							
1.3.2 104 week follow	/-up								
Kirkham 1990 Subtotal (95% CI)	7.08	5.9	49 <b>49</b>	9.85	8.45	27 <b>27</b>	61.7% <b>61.7%</b>	-0.40 [-0.87, 0.08] - <b>0.40 [-0.87, 0.08]</b>	
Heterogeneity: Not app	plicable								
Test for overall effect:	Z = 1.64 (F	P = 0.10)							
Total (95% CI)			64			66	100.0%	-0.41 [-0.79, -0.04]	•
Heterogeneity: Tau <sup>2</sup> = Test for overall effect: Test for subgroup diffe	Z = 2.18 (I	P = 0.03)	Ì		,,				-2 -1 0 1 Carer Intervention Control

### Figure 227: Carer health and well-being (clinically depressed) - follow-up

	Carer Interve	ention	Contr	ol		Risk Ratio	Risk	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Rand	om, 95% Cl	
Feinberg 2014	3	53	13	58	100.0%	0.25 [0.08, 0.84]	←		
Total (95% CI)		53		58	100.0%	0.25 [0.08, 0.84]			
Total events	3		13						
Heterogeneity: Not ap	plicable						0.5 0.7	1 1.5	2
Test for overall effect:	Z = 2.25 (P = 0	.02)					Carer intervention	Control	2

### Figure 228: Carer health and well-being (anxiety, trait) - post-treatment

	Carer I	nterven	tion	С	ontrol		:	Std. Mean Difference	Std. Mean Difference	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI	
Singer 1989	36	9.3	19	45.6	14.6	13	45.1%	-0.80 [-1.53, -0.06]		
Singer 1988	38.75	8.16	18	41.52	12.4	18	54.9%	-0.26 [-0.91, 0.40]		
Total (95% CI)			37			31	100.0%	-0.50 [-1.03, 0.03]		
Heterogeneity: Tau <sup>2</sup> =	,			P = 0.28	3); I² =	14%			-2 -1 0 1	2
Test for overall effect:	∠ = 1.86 (	P = 0.06	<b>5</b> )						Carer Intervention Control	

### Figure 229: Carer health and well-being (anxiety, state) – post-treatment

	Carer Ir	nterven	tion	С	ontrol		:	Std. Mean Difference		Std. M	ean Diffe	erence	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Ra	ndom, 9	5% CI	
Singer 1988	35.2	9.6	18	40.8	13.9	18	100.0%	-0.46 [-1.12, 0.20]					
Total (95% CI)			18			18	100.0%	-0.46 [-1.12, 0.20]					
Heterogeneity: Not ap	•								-2	-1	0	1	2
Test for overall effect:	Z = 1.36 (F	- = 0.18	)						Carer	Intervent	ion Cor	ntrol	

### Figure 230: Carer health and well-being (mental ill health) – post-treatment

	Carerl	nterven	tion	С	ontrol		:	Std. Mean Difference		Std. M	ean Diff	erence	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Ra	ndom, 9	95% CI	
Wong 2010	1.79	0.31	29	2.74	0.52	29	100.0%	-2.19 [-2.85, -1.53]	←				
Total (95% CI)			29			29	100.0%	-2.19 [-2.85, -1.53]					
Heterogeneity: Not ap Test for overall effect:	•	P < 0.00	0001)						-2 Carer	-1 Intervent	0 tion Co	1 ontrol	2

### Figure 231: Carer health and well-being (quality of life) – post-treatment

	Carer l	nterven	tion	С	ontrol		:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Wong 2010	3.32	0.52	29	2.8	0.65	29	100.0%	0.87 [0.33, 1.41]	
Total (95% CI)			29			29	100.0%	0.87 [0.33, 1.41]	•
Heterogeneity: Not ap Test for overall effect:		P = 0.00	)2)						-2 -1 0 1 2 Control Carer Intervention

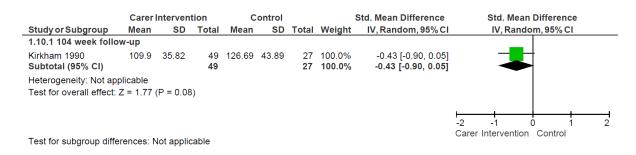
### Figure 232: Carer health and well-being (clinically stressed) – post-treatment

	Carer Interve	ention	Contr	ol		Risk Ratio	Risk	Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Rand	om, 95% Cl	
Feinberg 2014	2	53	17	58	100.0%	0.13 [0.03, 0.53]	←		
Total (95% CI)		53		58	100.0%	0.13 [0.03, 0.53]	_		
Total events	2		17						
Heterogeneity: Not ap	plicable						0.5 0.7		2
Test for overall effect:	Z = 2.84 (P = 0	.005)					0.5 0.7 Carer intervention	1 1.5 Control	2

### Figure 233: Carer health and well-being (stress) – post-treatment

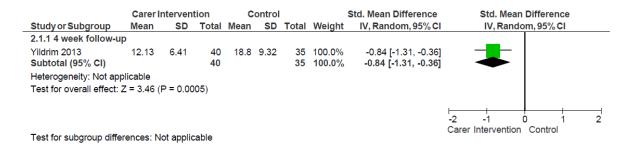
	Carer	Interven	tion	С	ontrol			Std. Mean Difference	Std. Mean Difference			
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI			
Wong 2010	-3.1	0.44	29	-2.63	0.57	29	23.2%	-0.91 [-1.45, -0.37]				
Feinberg 2014	85.5	19.6	53	94.2	25.6	58	34.4%	-0.38 [-0.75, -0.00]				
Kirkham 1990	104.43	37.85	143	114.19	37.93	72	42.4%	-0.26 [-0.54, 0.03]				
Total (95% CI)			225			159	100.0%	-0.45 [-0.78, -0.12]	•			
Heterogeneity: Tau² = Test for overall effect:	,	,		P = 0.11)	; I² = 54	%			-2 -1 0 1 Carer Intervention Control	2		

### Figure 234: Carer health and well-being (stress) – follow-up

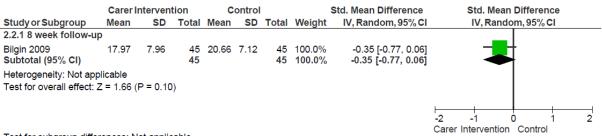


### A.11.2 Psychoeducational interventions for family carers versus any control

### Figure 235: Carer health and well-being (depression) - follow-up



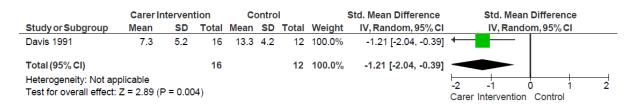
### Figure 236: Carer health and well-being (burnout) - follow-up



Test for subgroup differences: Not applicable

### A.11.3 Support interventions for family carers versus any control

Figure 237: Carer health and well-being (stress) - post-treatment



### A.11.4 Mindfulness interventions for paid carers versus any control

### Figure 238: Carer health and well-being (mental well-being) - post-treatment

	Carer I	nterven	tion	С	ontrol		:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% Cl
McConachie 2014	50.91	5.98	66	49.88	6.29	54	100.0%	0.17 [-0.19, 0.53]	-
Total (95% CI)			66			54	100.0%	0.17 [-0.19, 0.53]	•
Heterogeneity: Not ap Test for overall effect:	•	P = 0.36	<b>i</b> )						-2 -1 0 1 2 Control Carer Intervention

### Figure 239: Carer health and well-being (mental well-being) - follow-up

	Carer Ir	ntervent	tion	с	ontrol		:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% Cl	IV, Random, 95% Cl
5.2.1 6 week follow-u	р								
McConachie 2014 Subtotal (95% CI)	52.01	5.2	66 66	50.28	7.11	54 54		0.28 [-0.08, 0.64] 0.28 [-0.08, 0.64]	
Heterogeneity: Not ap Test for overall effect:		P = 0.13	)						
								-2	2 -1 0 1 2
Test for subgroup diffe	erences: No	ot applic	able						Control Carer Intervention

### Figure 240: Carer health and well-being (mental ill health) – post-treatment

	Carer I	nterven	tion	С	ontrol		:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Bethay 2013	7.83	4.95	18	12.31	4.66	16	34.3%	-0.91 [-1.62, -0.20]	<b>B</b>
McConachie 2014	10.16	3.37	66	11.47	4.1	54	65.7%	-0.35 [-0.71, 0.01]	
Total (95% CI)			84			70	100.0%	-0.54 [-1.06, -0.02]	-
Heterogeneity: Tau <sup>2</sup> = Test for overall effect:				P = 0.1	7);  ² =	47%			-2 -1 0 1 2 Carer Intervention Control

### Figure 241: Carer health and well-being (mental ill health) – follow-up

	Carer l	ntervent	ion	с	ontrol		5	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
5.4.1 6 week follow-up	)								
McConachie 2014	10.89	3.4	66	11.13	3.87	54	66.8%	-0.07 [-0.43, 0.29]	
Subtotal (95% CI)			66			54	66.8%	-0.07 [-0.43, 0.29]	
Heterogeneity: Not appl	icable								
Test for overall effect: Z	= 0.36 (	P = 0.72	)						
5.4.2 13 week follow-u	р								
Bethay 2013	7.94	3.28	18	10.13	4.05	16	33.2%	-0.58 [-1.27, 0.11]	
Subtotal (95% CI)			18			16	33.2%	-0.58 [-1.27, 0.11]	
Heterogeneity: Not appl	icable								
Test for overall effect: Z	= 1.66 (	P = 0.10	)						
Total (95% CI)			84			70	100.0%	-0.24 [-0.72, 0.24]	-
Heterogeneity: Tau <sup>2</sup> = 0	.06; Chi <sup>2</sup>	= 1.71, 0	df = 1 (	P = 0.19	9); l² =	41%			
Test for overall effect: Z	= 0.98 (	P = 0.33	) `						-2 -1 0 1 Carer Intervention Control
Test for subgroup different	ences: C	$hi^2 = 1.7^{-1}$	1 df = 1	1 (P = 0	19)	2 = 41 4	%		Carer Intervention Control

### Figure 242: Carer health and well-being (stress) – post-treatment

	Carer I	nterven	tion	С	ontrol		:	Std. Mean Difference	1	Std. Mea	an Diffe	rence	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI		IV, Ran	dom, 95	5% CI	
McConachie 2014	50.91	5.98	66	49.88	6.29	54	100.0%	0.17 [-0.19, 0.53]			-		
Total (95% CI)			66			54	100.0%	0.17 [-0.19, 0.53]			-		
Heterogeneity: Not ap Test for overall effect:	•	P = 0.36	<b>5</b> )						-2 Carer In	-1 terventio	on Con	1 trol	2

### Figure 243: Carer health and well-being (stress) – follow-up

	Carer	Intervent	tion	c	ontrol		:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
5.6.1 6 weeks follow u	up								
McConachie 2014	67.34	17.88	66	68.21	18.35	54	100.0%	-0.05 [-0.41, 0.31]	
Subtotal (95% CI)			66			54	100.0%	-0.05 [-0.41, 0.31]	•
Heterogeneity: Not app	olicable								
Test for overall effect:	Z = 0.26 (	(P = 0.79	))						
Total (95% CI)			66			54	100.0%	-0.05 [-0.41, 0.31]	•
Heterogeneity: Not app	olicable								-2 -1 0 1
Test for overall effect:	Z = 0.26 (	(P = 0.79	)						Carer Intervention Control
Test for subgroup diffe	rences: N	lot applic	able						Carel Intervention Control

### Figure 244: Carer health and well-being (burnout) - post-treatment

	Carer	Interven	tion	c	ontrol			Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Bethay 2013	15.44	10.53	18	17.5	11.42	16	100.0%	-0.18 [-0.86, 0.49]	
Total (95% CI)			18			16	100.0%	-0.18 [-0.86, 0.49]	-
Heterogeneity: Not ap Test for overall effect:	•	(P = 0.59	9)						-2 -1 0 1 Carer Intervention Control

### Figure 245: Carer health and well-being (burnout) – follow-up

	Carer	Interven	tion	0	Control		:	Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% Cl
5.8.1 13 week follow-	-up								
Bethay 2013 Subtotal (95% CI)	15.78	11.09	18 18	16.81	12.85	16 16	100.0% 100.0%	-0.08 [-0.76, 0.59] -0.08 [-0.76, 0.59]	
Heterogeneity: Not ap Test for overall effect:	•	(P = 0.81	1)						
									-2 -1 0 1 2
Test for subgroup diffe									Carer Intervention Control

Test for subgroup differences: Not applicable