

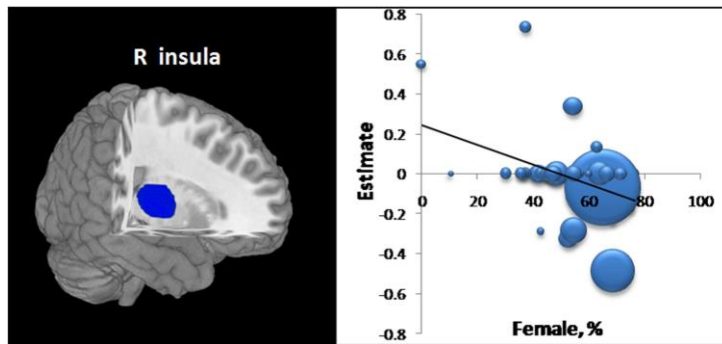
Appendix 1 to Jia Z, Wang X, Luo Q, et al. Brain grey-matter volume alteration in adult patients with bipolar disorder under different conditions: a voxel-based meta-analysis. *J Psychiatry Neurosci* 2018.

DOI: 10.1503/jpn.180002

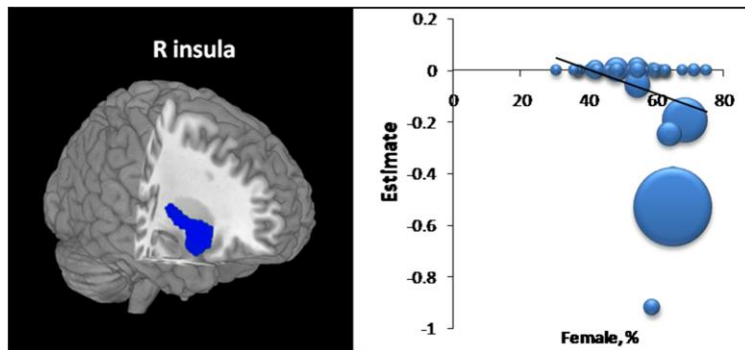
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Suppl Fig. 1. The percentage of female patients with bipolar disorder was negatively associated with gray matter volumes in the right insula.



Suppl Fig. 2. The percentage of female patients with bipolar disorder type I was negatively associated with gray matter volumes in the right insula.



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Supplementary table 1. General information in BD and HC and method of studies included in the meta-analysis (mean \pm SD).

Study	Bipolar Disorder Patients						Healthy Controls				Methods		
			R		Age Onset	Illness duration			R		Diagnosis criteria	Field strength (Tesla)	Smoothing (mm)
	N	Age	Females, n (%)	handedness, n (%)			N	Age	Females, n (%)	handedness, n (%)			
Adler et al. (2005)(1)	32	31.2 \pm 9.4	13(40.63)	31(96.88)	22.5 \pm 7.7	8.7 \pm 9.2	27	30.5 \pm 9.7	15(55.56)	31(96.30)	DSM-IV	3.0 T	12
Almeida et al. (2009)(2)	27	31.89 \pm 7.3	17(62.96)	NA	20.33 \pm 6.1	11.1 \pm 7.04	28	30.82 \pm 10.56	15(53.57)	NA	DSM-IV	3.0 T	12
Alonso-Lana et al. (2016)(3)	33	44.13 \pm 6.63	15(45.45)	33(100)	NA	16.76 \pm 7.44	28	44.01 \pm 6.03	16(57.14)	28(100)	DSM-IV	1.5T-FSL	9.4
Altamura et al. (2017a)(4)	17	38.7 \pm 8.2	13(76.47)	NA	25.7 \pm 7.0	11.4 \pm 7.0	27	34 \pm 10	11(40.74)	NA	DSM-IV	3.0 T	6
Altamura et al. (2017b)(4)	10	35.7 \pm 13.2	1(10.0)	NA	25.6 \pm 6.5	12.1 \pm 8.5	27	34 \pm 10	11(40.74)	NA	DSM-IV	3.0 T	6

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Amann et al. (2016)(5)	45	42.9±9.2	19(42.22)	45(100)	NA	17.6±11.8	45	43.3±9.9	19(42.22)	45(100)	DSM-IV	1.5T	9.4
Ambrosi et al. (2013)(6)	20	41.95±13.1	15(75.00)	20(100)	NA	12.6±8.57	21	34.61±10.8	15(71.43)	21(100)	DSM-IV	1.5T	8
Brown et al. (2011)(7)	15	46.2±10.6	8(53.33)	NA	NA	18.9±6.9	21	45.0±10.2	11 (52.38)	NA	DSM-IV	1.5 T	8
Bruno et al. (2004)(8)	39	39.1	26(66.67)	NA	NA	13.2	35	34.8	25 (71.43)	NA	DSM-IV	1.5 T	8
Cai et al. (2015)(9)	23	25.65±6.589	7(30.43)	23(100)	19.7±4.91	6.09±3.667	23	28.2±3.781	10 (43.48)	23(100)	DSM-IV	3.0 T	8
Chen et al. (2007)(10)	24	38.21±11.04	18(75.00)	24(100)	NA	14.17±10.26	25	38.44±11.05	18 (72.00)	25(100)	DSM-IV	1.5 T	12
Chen et al. (2012)(11)	18	32.0±7.6	0(0.00)	18(100)	24.4±6.8	4.2	27	31.3±6.8	0 (0.00)	27(100)	DSM-IV	3.0 T	8
Cui et al.	24	28.42±6.64	9 (37.50)	24(100)	22.38±5.82	NA	36	26.56±6.70	15 (41.67)	36(100)	DSM-IV	3.0 T	6

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(2011)(12)													
de Azevedo-Marques Périco et al.	26	27.1±8.5	16(61.54)	26(100)	NA	0.48±0.34	94	30.2±8.4	41(43.62)	91(96.81)	DSM-IV	1.5 T	8
(2011)(13)													
Doris et al.	11	40.5±11.6	5(45.45)	NA	24.3±5.1	16.2±11.1	16	39.1±10.5	9 (56.25)	NA	DSM-IV	2.0 T	8
(2004)(14)													
Duarte et al. (2016a)(15)	20	40.35±10.21	14(70.0)	20(100)	25.45±8.4	15.10±8.6	20	37.40±10.20	11 (55.0)	20(100)	MINI-Plus	1.5T	8
Duarte et al. (2016b)(15)	19	43.05±13.87	9(47.4)	19(100)	26.63±9.6	16.21±11.4	20	37.40±10.20	11 (55.0)	20(100)	MINI-Plus	1.5T	8
Eker et al. (2014)(16)	28	36.4±7.8	12 (42.86)	NA	20.3±6.1	16.25±8.5	30	34.7±8.4	20(66.67)	NA	DSM-IV	3.0 T	8
Emsell et al. (2013)(17)	60	42±10	29 (48.33)	52(86.67)	28±8	13±9	60	42±10	29(48.33)	56(93.33)	DSM-IV	1.5 T	8

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Frangou et al. (2012) (18)	47	46.2±11.5	26 (55.32)	NA	25.5±8.2	20.0±9.1	71	39.8±15.3	35(49.30)	NA	DSM-IV	1.5 T	12
Ha et al. (2009a)(19)	23	35.6±11.14	15 (65.22)	23(100)	25.2± 10.20	10.4± 8.85	23	36.0±9.41	15(65.22)	23(100)	DSM-IV	1.5 T	10
Ha et al. (2009b)(19)	23	35.2±9.98	15 (65.22)	23(100)	24.7 ± 8.34	10.5± 7.39	23	36.0±9.41	15(65.22)	23(100)	DSM-IV	1.5 T	10
Haldane et al. (2008)(20)	44	42.7±11	24 (54.55)	42(95.45)	25.6±9.1	16.3±10.7	44	43.1±11.2	24 (54.55)	40(90.91)	DSM-IV	1.5 T	5
Ivleva et al. (2012)(21)	17	38.24±7.28	9 (52.95)	NA	NA	14.76±9.07	10	43.9±9.86	6(60)	NA	DSM-IV	3.0 T	12
Ivleva et al. 2013)(22)	115	35.4±12.5	79 (68.70)	95(82.61)	20.2±8.7	NA	200	39.8±12.1	108 (54)	179(89.5)	DSM-IV	3.0 T	12
Kozicky et al. (2016a)(23)	21	NA	NA	NA	NA	NA	25	22. ±4.0	14 (56.0)	NA	DSM-IV	3.0 T	8
Kozicky et al.	20	NA	NA	NA	NA	NA	25	22.0±4.0	14 (56.0)	NA	DSM-IV	3.0 T	8

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(2016b)(23)													
Li et al.	24	28.42±6.64	9 (37.50)	24(100)	22.38±6.64	NA	36	26.56±6.70	15(41.67)	36(100)	DSM-IV	3.0T	8
(2011)(24)													
Lochhead et al.	11	38.2±10.8	5 (45.45)	11(100)	24.3±9.2	NA	31	36±14.0	15(48.39)	31(100)	DSM-IV	1.5 T	8
(2004)(25)													
Lyoo et al.	39	38.3±11.6	23 (58.97)	37(94.87)	18.6±7.0	18.1±11.0	43	35.7±10.1	24(55.81)	40(93.02)	DSM-IV	1.5 T	8
(2004)(26)													
McDonald et al.	37	40.7±11.6	22 (59.46)	NA	22.9±5.5	17.8±11.3	52	39.3±14.8	28 (53.85)	NA	DSM-IV	1.5 T	8
(2005)(27)													
McIntosh et al.	26	40.5±12.1	12 (46.15)	24(92.31)	NA	NA	49	35.27±11.1	26 (53.06)	46(93.88)	DSM-IV	1.5 T	8
(2004a)(28)													
McIntosh et al.	19	39.74±9.2	12 (63.16)	19(100)	NA	NA	49	35.27±11.1	26 (53.06)	46(93.88)	DSM-IV	1.5 T	8
(2004b)(28)													
Molina et al.	19	38.3±8.3	7 (36.84)	NA	NA	12.0±6.52	24	34.6±8.6	8 (33.33)	NA	DSM-IV	1.5 T	8
(2011)(29)													

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Narita et al. (2011a)(30)	17	41.4±11.9	8 (47.06)	17(100)	31.9±11.9	6.2±5.3	84	41.1±11.4	36 (42.86)	84(100)	DSM-IV	1.5T	12
Narita et al. (2011b)(30)	14	40.2±10.9	6 (42.86)	14(100)	27.4±8.7	8.6±8.1	84	41.1±11.4	36 (42.86)	84(100)	DSM-IV	1.5T	12
Nenadic et al. (2015)(31)	17	37.69±11.13	8 (47.06)	NA	NA	9.9±8.7	34	34.33±10.62	16 (47.06)	NA	DSM-IV	3.0 T	12
Nery et al. (2015)(32)	25	35.7±8.9	17 (68)	21(84)	22.1±8.5	13.6±8.1	27	31.2±9.5	16 (59.26)	26(96.30)	DSM-IV	3.0 T	8
Neves Mde et al. (2015)(33)	21	38.95±13.54	11 (52.38)	21(100)	NA	11.6±8.99	21	37.86±8.22	11 (52.38)	21(100)	DSM-IV	1.5T	8
Nugent et al. (2006a)(34)	20	41±8.3	15 (75)	NA	18±8.8	23±9.0	65	38±11.8	46 (70.77)	NA	DSM-IV	3.0 T	8
Nugent et al. (2006b)(34)	16	37±7.5	11 (68.75)	NA	21±6.5	17±10.0	65	38±11.8	46 (70.77)	NA	DSM-IV	3.0 T	8
Ota et al.	43	NA	21 (48.84)	NA	NA	NA	229	NA	168(73.36)	NA	DSM-IV	3.0T	12

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(2016)(35)													
Poletti et al.	206	46.15±12.97	134	NA	30.50±9.51	15.46±10.36	136	33.31±12.97	68(50)	NA	DSM-IV	3.0 T	8
			(65.05)										
Redlich et al.	58	37.5±11.0	37 (63.79)	NA	23.2±9.4	14.17±9.02	58	37.7±9.7	37(63.79)	NA	NA	3.0 T	8
(2014)(37)													
Rocha-Rego et al.(2014a)(38)	26	41.5±11.27	14(53.85)	NA	25.7±9.22	NA	26	41.3±11.65	14(53.85)	NA	DSM-IV	1.5 T	8
Rocha-Rego et al.(2014b)(38)	14	37.6±11.97	8(57.14)	NA	18.8±7.43	NA	14	37.4±10.98	8(57.14)	NA	DSM-IV	1.5 T	8
Rossi et al.	14	43±8	5 (35.71)	NA	NA	17±5	40	40±11	21 (52.5)	NA	DSM-IV	1.5 T	8
(2013)(39)													
Sarıççek et al.	28	36.3±9.5	20 (71.43)	NA	26.3±7.9	10.6±6.4	29	33.6±9.3	16 (55.17)	NA	DSM-IV	1.5T	8
(2015)(40)													
Scherk et al.	35	43.31±12.48	17 (48.57)	31(88.57)	28.38±	14.38±10.93	32	33.71±11.81	20 (62.5)	25(78.13)	DSM-IV	1.5 T	8
					8.91								
(2008)(41)													

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Shepherd et al. (2015)(42)	30	39.06±12.8	18 (60)	27(90.00)	25.59±11.2	NA	34	32.6±10.6	18 (52.94)	29(85.29)	ICD-10	3.0 T	8
Song et al. (2015)(43)	44	34.8±14.1	25 (52.82)	42(95.45)	NA	NA	35	33.9±14.5	24 (68.57)	33(94.29)	DSM-IV	3.0 T	8
Stanfield et al. (2009)(44)	66	36.4±11.1	36 (54.55)	NA	NA	15.4±10.0	66	39.0±10.9	35(53.03)	NA	DSM-IV	1.5 T	12
Tang et al. (2014)(45)	27	32.04±11.20	17(62.96)	27(100)	NA	4.19±1.71	27	32.59±11.76	16(59.26)	27(100)	DSM-IV	3.0 T	8
Tost et al. (2010)(46)	42	42.4±13.1	23(54.76)	NA	27.5±11.8	15.9±9.0	42	42.2±13.6	23 (54.76)	NA	DSM-IV	1.5 T	12
Watson et al. (2012)(47)	24	36.0±10.0	16(66.67)	NA	NA	NA	24	35.6±9.7	16(66.67)	NA	ICD-10	1.5 T	4
Yatham et al. (2007)(48)	15	36±13	9(60)	14(93.33)	NA	3.9±8.1	15	36±13	9(60)	14(93.33)	DSM-IV	1.5 T	8
Yip et	38	20.9±3.1	18(47.37)	36(94.74)	NA	NA	37	21.2±2.3	17(45.95)	34(91.89)	MINI	3.0T	7

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al.(2013)(49)

Yüksel et al. (2012)(50)	27	32.9±11.9	10(35.71)	NA	NA	NA	43	36.4±10.5	15(34.88)	NA	DSM-IV	3.0T	12
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Note. Abbreviations: NA, not available; R, right.

Supplementary table 2. Clinical information in bipolar disorder groups.

Study	Subjects	N	Subtype I/II/other	Euthymic/ depressed/ mania/other	Euthymia, n (%)	Depression, n (%)	Lith, n (%)	Valproate Sodium, n (%)	Antidepressant, n (%)	Antipsychotic medication, n (%)	HAMD-17	YMRS
Adler et al. (2005)(1)	BD-I	32	32/0/0	25/2/5/0	25(78.13)	2(6.25)	NA	NA	NA	NA	NA	NA
Almeida et al. (2009)(2)	BD-I	27	27/0/0	17/10/0/0	17(62.96)	10(37.04)	16(59.26)	1(3.70)	10(37.04)	16(59.26)	NA	NA
Alonso-Lana et al.	BD-I	33	33/0/0	33/0/0/0	33(100.00)	0(0.00)	22(66.67)	NA	8(24.24)	21(63.64)	NA	1.18±1.81

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(2016)(3)

Altamura et al.	BD-I	17	17/0/0	NA	NA	NA	NA	NA	3(17.65)	12(70.59)	NA	NA
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(2017a)(4)

Altamura et al.	BD-I	10	10/0/0	NA	NA	NA	NA	NA	0(0.0)	6(60.0)	NA	NA
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(2017b)(4)

Amann et al.	BD-I	45	45/0/0	15/15/15/0	15(33.33)	15(33.33)	15(33.33)	NA	NA	NA	NA	8.5±10.9
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(2016)(5)

Ambrosi et al.	BD- II	20	0/20/0	20/0/0/0	20(100.00)	0(0.00)	7(36.84)	NA	8 (42.11)	10 (52.63)	NA	NA
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(2013)(6)

Brown et al.	BD-I	15	15/0/0	0/15/0/0	0(0.00)	15(100.00)	NA	NA	9(60.00)	3(20.00)	NA	NA
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(2011)(7)

Bruno et al.	BD	39	28/11/0	NA	NA	NA	23(58.97)	3(7.69)	11(28.21)	9(23.08)	NA	NA
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(2004)(8)

Cai et al. (2015)(9)	BD-I	23	23/0/0	0/23/0/0	0(0.00)	23(100.00)	6(26.09)	NA	6(26.09)	NA	28.52±9.342	NA
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Chen et al. (2007)(10)	P-BD-I	24	24/0/0	NA	NA	NA	12 (50.00)	NA	NA	0(0.00)	NA	NA
Chen et al. (2012)(11)	P-BD	18	NA	0/0/18/0	0(0.00)	0(0.00)	15 (83.33)	NA	NA	3(16.67)	3.2±1.1	24.8±6.8
Cui et al. (2011)(12)	P-BD-I	24	24/0/0	0/0/24/0	0(0.00)	0(0.00)	17 (70.83)	NA	NA	10 (41.67)	NA	25.9±6.86
de Azevedo-Marques Périco et al. (2011)(13)	P-BD-I	26	21/0/0	0/23/3/0	0(0.00)	23(88.46)	6(23.08)	NA	2 (7.69)	11 (42.31)	7.6±10.1	7.4±10.4
Doris et al. (2004)(14)	BD-I	11	11/0/0	11/0/0/0	11(100.00)	0(0.00)	N/A	NA	1(9.09)	5(45.45)	8.3±3.1	NA
Duarte et al. (2016a)(15)	BD-I	20	20/0/0	20/0/0/0	20(100.00)	0(0.00)	10 (50.0)	NA	4 (20.0)	6 (30.0)	NA	NA
Duarte et al.	BD-I	19	19/0/0	19/0/0/0	19(100.00)	0(0.00)	10 (52.6)	NA	3 (15.8)	9 (47.4)	NA	NA

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(2016b)(15)

Eker et al.	BD-I	28	28/0/0	28/0/0/0	28(100.00)	0(0.00)	23 (82.14)	NA	3 (10.71)	17 (60.71)	2.3±3.4	1.0±1.8
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(2014)(16)

Emsell et al.	BD-I	60	60/0/0	60/0/0/0	60(100.00)	0(0.00)	46(76.67)	NA	11(18.33)	34(56.67)	NA	NA
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(2013)(17)

Frangou et al.	BD-I	47	47/0/0	60/0/0/0	60(100.00)	0(0.00)	17(28.33)	10(16.67)	13(21.67)	17(28.33)	NA	1.3±2.9
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(2012) (18)

Ha et al.	BD-I	23	23/0/0	19/4/0/0	19(82.61)	4(17.39)	8 (34.78)	6(26.09)	NA	10(43.48)	8.8±6.81	NA
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(2009a)(19)

Ha et al.	BD-II	23	0/23/0	16/7/0/0	16(69.57)	7(30.43)	7 (30.43)	3(13.04)	3(13.04)	8(34.78)	13.1±8.31	NA
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(2009b)(19)

Haldane et al.	BD-I	44	44/0/0	44/0/0/0	44(100.00)	0(0.00)	NA	NA	8 (18.18)	22 (50.00)	NA	NA
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(2008)(20)

Ivleva et al.	P-BD-I	17	17/0/0	NA	NA	NA	NA	NA	9(52.94)	9(52.94)	NA	NA
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(2012)(21)

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McIntosh et al. (2004b)(28)	BD-I	19	12/0/0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Molina et al. (2011)(29)	BD-I	19	19/0/0	19/0/0/0	19(100.00)	0(0.00)	16(84.21)	4(21.05)	NA	1(5.26)	NA	NA
Narita et al. (2011a)(30)	BD-II	17	0/17/0	6/9/2/0	6(35.29)	9(52.94)	11(64.71)	5 (29.41)	7 (41.18)	2(11.76)	NA	NA
Narita et al. (2011b)(30)	BD-II	14	0/14/0	2/10/2/0	2(14.29)	10(71.43)	11(78.57)	8 (57.14)	5 (35.71)	3(21.43)	NA	NA
Nenadic et al. (2015)(31)	P-BD-I	17	17/0/0	17/0/0/0	17(100.00)	0(0.00)	8 (47.06)	2(11.76)	NA	11(64.71)	2.7±2.3	2.7±2.2
Nery et al. (2015)(32)	BD-I	25	25/0/0	25/0/0/0	25(100.00)	0(0.00)	12 (48.00)	NA	5 (20.00)	13 (52.00)	2.9±2.6	1.2±2.1
Neves Mde et al. (2015)(33)	BD-I	21	21/0/0	21/0/0/0	21(100.00)	0(0.00)	11 (52.38)	7 (33.33)	0(0.00)	8 (38.09)	NA	3±2.5
Nugent et al.	BD	20	4/16/0	0/20/0/0	0(0.00)	20(100.00)	12 (60.00)	6(30.00)	NA	NA	NA	NA

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(2006a)(34)

Nugent et al.	BD	16	3/13/0	0/16/0/0	0(0.00)	16(100.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	NA	NA
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(2006b)(34)

Ota et al.	BD	43	12/31/0	14/29/0/0	14(32.56)	29(67.44)	NA	NA	NA	NA	NA	NA
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(2016)(35)

Poletti et al.	BD-I	206	206/0/0	0/206/0/0	0(0.00)	206(100.00)	72 (34.95)	NA	NA	61(29.61)	19.56±4.82	NA
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(2016)(36)

Redlich et al.	BD-I	58	58/0/0	0/58/0/0	0(0.00)	58(100.00)	15 (25.86)	NA	NA	37(63.79)	21.0±6.0	3.0±2.7
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(2014)(37)

Rocha-Rego et al.	BD-I	26	26/0/0	26/0/0/0	26(100.00)	0(0.00)	10 (38.46)	2(7.69)	NA	8(30.77)	6.6±3.39	1.8±4.11
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(2014a)(38)

Rocha-Rego et al.	BD-I	14	14/0/0	14/0/0/0	14(100.00)	0(0.00)	00(0.00)	10(71.43)	0(0.00)	0(0.00)	4.2±5.15	1.7±3.12
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(2014b)(38)

Rossi et al.	BD	14	13/1/0	14/0/0/0	14(100.00)	0(0.00)	5 (35.71)	NA	3(21.43)	14(100.00)	NA	NA
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(2013)(39)

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Sarıççek et al. (2015)(40)	BD-I	28	28/0/0	28/0/0/0	28(100.00)	0(0.00)	18 (64.29)	12(42.86)	2(7.14)	14(50.00)	1.3±1.4	0.6±0.9
Scherk et al. (2008)(41)	BD-I	35	35/0/0	35/0/0/0	35(100.00)	0(0.00)	12 (34.29)	NA	NA	18(51.43)	NA	2.54±2.79
Shepherd et al. (2015)(42)	BD-I	30	30/0/0	NA	NA	NA	NA	NA	8(26.67)	NA	NA	6.7±8.4
Song et al. (2015)(43)	P-BD	44	NA	NA	NA	NA	9(20.45)	NA	NA	44(100.00)	NA	23.9±12.2
Stanfield et al. (2009)(44)	BD-I	66	66/0/0	66/0/0/0	66(100.00)	0(0.00)	NA	NA	24(36.36)	31 (46.97)	NA	NA
Tang et al. (2014)(45)	BD-I	27	27/0/0	0/27/0/0	0(0.00)	27(100)	9(33.33)	21(77.78)	16(59.26)	16(59.26)	19.67±2.43	1.04±0.94
Tost et al. (2010)(46)	P-BD-I	42	42/0/0	42/0/0/0	42(100.00)	0(0.00)	NA	NA	12(28.57)	16(38.10)	NA	11.4±15.4
Watson et al.	BD	24	NA	NA	NA	NA	2(8.33)	NA	NA	19(79.17)	NA	NA

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(2012)(47)

Yatham et al.	BD-I	15	15/0/0	0/0/15/0	0(0.00)	0(0.00)	NA	NA	7(46.67)	NA	NA	27±5.9
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(2007)(48)

Yip et al.	BD-II/NOS	38	0/25/13	38/0/0/0	38(100.00)	0(0.00)	NA	NA	NA	NA	NA	1.8±2.5
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(2013)(49)

Yüksel et al.	P-BD-I	27	28/0/0	4/0/18/5	4(14.81)	0(0.00)	13 (48.15)	NA	0(0.00)	NA	NA	22.8±10.3
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(2012)(50)

Note. Abbreviations: BD-I = bipolar disorder type I, BD-II = bipolar disorder type II, BD-II/NOS = BD-II or BD not-otherwise-specified, HAMD-17 = Hamilton Depression Rating Scale 17-item, NA = not available, P-BD = psychotic bipolar disorder, YMRS = Young Mania Rating Scale.

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Supplementary table 3. Clusters showing differences between bipolar disorder and controls did not meet our criteria for robustness

Regions	Brodman n areas	Peak MNI oordinate x,y,z			Z	p	Voxels size
Left superior frontal gyrus, medial		-2	48	32	-3.219	<0.001	134
Left anterior cingulate/paracingulate gyri	10	-2	52	0	-2.894	<0.001	160
Right superior frontal gyrus, medial	10	4	54	14	-2.782	<0.001	220

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Supplementary table 4. Clusters showing differences between bipolar disorder type I and controls did not meet our criteria for robustness

Regions	Brodman n areas	Peak MNI coordinate x,y,z			Z	p	Voxels size
Left superior frontal gyrus, medial	9	-4	52	32	-2.64	<0.001	86
Left superior frontal gyrus, medial	10	2	54	24	-2.632	<0.001	152
Left anterior cingulate/paracingulate gyri	32	-6	44	6	-1.910	0.004	16
Left insula	48	-30	12	-18	-2.322	<0.001	58

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Supplementary table 5. Clusters showing differences between euthymic bipolar disorder and controls did not meet our criteria for robustness

Regions	Brodmann areas	Peak MNI coordinate x,y,z			Z	p	Voxels size
(undefined)	48	-34	-12	-8	1.361	<0.001	84
Left striatum		-28	-4	-4	1.280	<0.001	57
Left lenticular nucleus, putamen	48	-26	6	-4	1.111	0.001	139
Left temporal pole, middle temporal gyrus	38	-48	14	-38	1.130	<0.001	10
Left inferior frontal gyrus, orbital part	47	-38	24	-12	-1.702	<0.001	219
Right thalamus		4	-14	10	-1.466	0.002	16
(undefined)		0	-14	12	-1.452	0.002	21

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Supplementary table 6. Clusters showing differences between depressed bipolar disorder and controls did not meet our criteria for robustness

Regions	Brodmann areas	Peak MNI coordinate x,y,z			Z	p	Voxels size
Right temporal pole, superior temporal gyrus	38	54	4	-2	-2.906	<0.001	241
		56	4	-12	-2.609	<0.001	
		56	2	-8	-2.484	<0.001	

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Supplementary table 7. Clusters showing differences between psychotic bipolar disorder and controls did not meet our criteria for robustness

Regions	Brodmann areas	Peak MNI coordinate x,y,z			Z	p	Voxels size
(undefined)		46	-14	44	-2.253	<0.001	98
Right precuneus	23	4	-54	22	-2.143	0.002	31
Left median cingulate / paracingulate gyri	23	-6	-24	40	-2.145	0.002	24

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Supplementary table 8. Clusters showing significant between study heterogeneity in bipolar disorder

Regions	Brodmann areas	Peak MNI			Z	p	Voxels size
		Coordinate x,y,z					
Left superior frontal gyrus, medial	32	-2	48	20	2.864	<0.001	150
Left anterior cingulate/paracingulate gyri	24	0	38	18	2.678	<0.001	78
Right superior frontal gyrus, medial orbital	11	2	46	-10	2.010	<0.001	119
Right temporal pole, superior temporal gyrus	38	30	6	-22	2.941	<0.001	94
(undefined)		8	6	16	1.949	<0.001	36

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Supplementary table 9. Clusters showing significant between study heterogeneity in bipolar disorder type I

Regions	Brodmann areas	Peak MNI coordinate x,y,z			Z	p	Voxels size
Left anterior cingulate/paracingulate gyri	24	0	38	20	2.723	<0.001	125
Left anterior cingulate/paracingulate gyri	32	-2	44	16	2.644	<0.001	232
Right superior frontal gyrus, medial orbital	11	0	40	-8	1.309	0.001	48
Right temporal pole, superior temporal gyrus	38	32	6	-22	4.068	<0.001	119
Left temporal pole, superior temporal gyrus	38	-34	8	-20	1.929	<0.001	156
Left temporal pole, superior temporal gyrus	38	-34	8	-24	1.886	<0.001	
Left temporal pole, middle temporal gyrus	20	-42	12	-34	1.585	<0.001	49
(undefined)		8	6	16	3.363	<0.001	54
Right fusiform gyrus	30	26	-34	-18	2.077	<0.001	66
Right middle temporal gyrus	21	56	-56	18	2.089	<0.001	70
Right inferior frontal gyrus, orbital part	47	42	24	-8	1.167	0.001	66
Right insula	47	36	20	-2	1.117	0.002	58
Left caudate nucleus		-8	6	6	1.282	0.001	13
Left inferior frontal gyrus, orbital part	47	-46	28	-8	1.094	0.002	50
Left inferior frontal gyrus, orbital part	47	-46	32	-6	1.091	0.002	
Left inferior occipital gyrus	37	-56	-66	-14	1.473	0.001	18
(undefined)		0	6	12	1.045	0.002	20

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Supplementary table 10. Clusters showing significant between study heterogeneity in euthymic bipolar disorder

Regions	Brodmann areas	Peak MNI coordinate x,y,z			Z	p	Voxels size
(undefined)	48	-34	-12	-8	1.361	<0.001	57
Left striatum		-28	-4	-4	1.28	<0.001	139
Left lenticular nucleus, putamen	48	-26	6	-4	1.111	0.001	84
Left inferior temporal gyrus	20	-46	10	-40	1.130	<0.001	21
Left temporal pole, middle temporal gyrus	38	-48	14	-38	1.130	<0.001	10
Right inferior frontal gyrus, opercular part	44	54	14	14	-1.620	<0.001	81
		54	12	20	-1.486	0.002	
Right inferior frontal gyrus, opercular part	48	54	14	10	-1.617	<0.001	79
		54	20	10	-1.536	0.001	
Right inferior frontal gyrus, triangular part	45	50	30	16	-1.592	0.001	281
		44	36	26	-1.396	0.003	
		48	34	2	-1.576	0.001	
Right inferior frontal gyrus, triangular part	48	54	18	16	-1.591	0.001	45
Right middle frontal gyrus	46	38	42	30	-1.461	0.002	50
	45	46	36	22	-1.382	0.003	19
Left inferior frontal gyrus, orbital part	47	-36	32	-12	-1.781	<0.001	219
		-40	30	-4	-1.768	<0.001	
		-38	24	-12	-1.702	<0.001	

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		-46	32	-14	-1.661	<0.001	
		-46	42	-6	-1.467	0.002	
Left inferior frontal gyrus, orbital part	38	-44	26	-14	-1.581	0.001	31

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Supplementary table 11. Clusters showing significant between study heterogeneity in depressed bipolar disorder

Regions	Brodmann areas	Peak MNI coordinate x,y,z			Z	p	Voxels size
(undefined)		8	8	16	5.483	<0.001	53
Left parahippocampal gyrus	30	-26	-26	-24	5.295	<0.001	71
	30	-24	-26	-22	5.295	<0.001	
	30	-26	-26	-22	5.295	<0.001	
	30	-24	-26	-24	5.295	<0.001	
Right parahippocampal gyrus	30	26	-26	-20	4.642	<0.001	37
Right anterior cingulated/paracingulate gyri		4	14	24	4.708	<0.001	22
		4	10	26	4.681	<0.001	
Right angular gyrus	39	56	-62	26	4.232	0.001	42
Right inferior frontal gyrus, triangular part	45	52	36	24	4.043	0.002	14

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Supplementary table 12. Clusters showing significant between study heterogeneity in psychotic bipolar disorder

Regions	Brodmann areas	Peak MNI coordinate x,y,z			Z	p	Voxels size
Right lenticular nucleus, putamen	48	2	-12	10	3.299	<0.001	1067
Left insula	48	-34	-6	8	1.610	<0.001	201
(undefined)	36	-30	0	-24	1.764	<0.001	109
Right anterior cingulate / paracingulate gyri	32	4	50	20	1.754	<0.001	85
Left middle temporal gyrus	21	-60	0	-24	1.955	<0.001	61
(undefined)	27	-20	-34	2	1.708	<0.001	39
Right middle temporal gyrus	21	56	-52	14	1.287	0.002	43
Left caudate nucleus	25	-8	12	10	1.245	0.002	36
Right precentral gyrus	6	42	-10	44	1.579	<0.001	31
Left inferior parietal gyri	40	-42	-50	44	1.287	0.002	33
Right caudate nucleus		10	14	14	1.225	0.002	29

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