Supplementary Table SI. Baseline characteristics of all patients and for patients who completed or did not complete the BDI-II questionnaire.

Characteristic	All patients	BDI-II complete	BDI-II incomplete
n*	1155	474	681
Age, mean (SD)	57.4 (12.3)	55.5 (12.5)	58.7 (12.0)
Female sex, n (%)	856 (74.1)	359 (75.7)	497(73.0)
RA disease duration, mean (SD)	10.1 (9.1)	10.6 (9.2)	9.7 (9.1)
[n evaluated]	[1128]	[468]	[660]
Disease activity measures, mean (SD)			
DAS28-ESR	4.9 (1.3)	4.9 (1.2)	4.9 (1.3)
[n evaluated]	[927]	[395]	[532]
CDAI	25.1 (11.7)	24.3 (10.2)	25.7 (12.6)
[n evaluated]	[1085]	[456]	[629]
Patient-reported outcomes			
BDI-II, mean (SD)	14.9 (11.2)	14.9 (11.2)	NA
[n evaluated]	[474]	[474]	NA
STAI-State, mean (SD)	44.1 (11.7)	43.4 (11.4)	45.5 (12.2)
[n evaluated]	[613]	[419]	[194]
STAI-Trait, mean (SD)	42.5 (11.0)	42.1 (11.1)	43.5 (10.8)
[n evaluated]	[611]	[421]	[190]
Use of antidepressants, n (%)	87 (7.5)	32 (6.8)	55 (8.1)
Suicidal ideation, n (%)	68 (10.8)	50 (10.5)	18 (11.7)
[n evaluated]	[628]	[474]	[154]
PGA, mean (SD)	63.5 (21.5)	62.3 (22.4)	64.3 (20.8)
[n evaluated]	[1120]	[465]	[655]
PhGA, mean (SD)	58.9 (19.9)	57.8 (21.5)	59.6 (18.7)
[n evaluated]	[1109]	[464]	[645]
HAQ-DI, mean (SD)	1.2 (0.7)	1.1 (0.7)	1.2 (0.7)
[n evaluated]	[955]	[467]	[488]
Fatigue, mean (SD)	56.1 (28.0)	55.7 (28.5)	56.5 (27.5)
[n evaluated]	[807]	[362]	[445]
Pain, mean (SD)	59.6 (25.1)	57.4 (26.7)	61.4 (23.7)
[n evaluated]	[812]	[362]	[450]
Sleep disturbance, mean (SD)	47.3 (31.1)	45.7 (32.0)	48.6 (30.3)
[n evaluated]	[804]	[360]	[444]
Therapy, n/N (%)			
SC TCZ therapy	1155/1155 (100)	474/474 (100)	681/681 (100)
TCZ + any sDMARD,	378/1155 (32.7)	165/474 (34.8)	213/681 (31.3)
TCZ without sDMARD	777/1155 (67.3)	309/474 (65.2)	468/681 (68.7)
Systemic glucocorticoids	743/1155 (64.3)	299/474 (63.1)	444/681 (65.2)
Mean glucocorticoid dose in mg/day (SD)	7.1 (5.0)	6.8 (4.8)	7.3 (5.1)
[n evaluated]	[743]	[299]	[444]

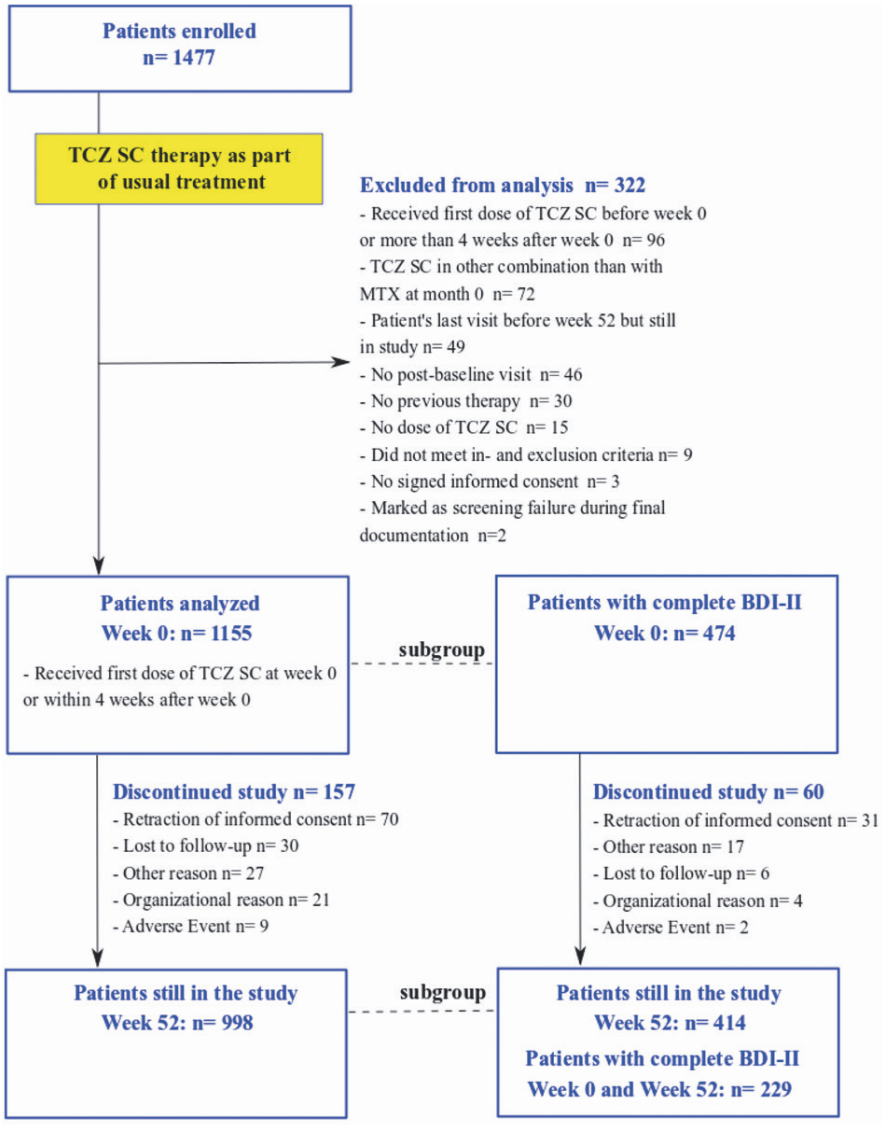
*Unless otherwise indicated

BDI-II: Beck Depression Inventory II; CDAI: Clinical Disease Activity Index; DAS28: Disease Activity Score based on 28 joint count; ESR: erythrocyte sedimentation rate; HAQ-DI: Health Assessment Questionnaire-Disability Index; NA: not applicable; PGA: patient global assessment; PhGA: physician global assessment; RA: rheumatoid arthritis; SC: subcutaneous; SD: standard deviation; sDMARD: synthetic disease-modifying anti-rheumatic drug (methotrexate [oral or parental], leflunomide, cyclosporine A, gold, azathioprine, tofacitinib, sulfasalazine); STAI: State-Trait Anxiety Index; TCZ: tocilizumab.

Supplementary Table S2. Baseline comorbidities (current concomitant disease) by BDI-II subgroup. Data are presented as percentage of patients.

Adverse event	No depression (BDI-II <14) (n=248)	Mild depression (BDI-II 14-19) (n=87)	Moderate depression (BDI-II 20-28) (n=84)	Severe depression (BDI-II ≥29) (n=55)
Arterial hypertension	38.1	35.6	32.5	49.1
Degenerative joint/spine disease	23.5	25.3	26.5	25.5
Osteoporosis	16.2	18.4	13.3	18.2
Diabetes mellitus	10.1	8.0	12.0	14.5
Lipid metabolism disease	8.5	14.9	8.4	7.3
Depression	5.3	6.9	9.6	14.5
Renal disease	6.5	6.9	6.0	7.3
Hepatic disease	2.4	5.7	8.4	9.1
Malignancies	2.8	0	6.0	3.6
Fibromyalgia	0.8	3.4	2.4	7.3

BDI-II: Beck Depression Inventory II,



Supplementary Fig. S1. Patient disposition in the effectiveness analysis set and BDI-II cohort over the 52-week observation period. BDI-II: Beck Depression Inventory II; MTX: methotrexate; SC: subcutaneous; TCZ: tocilizumab.

Supplementary Table S3. Outcome values at week 52 by depression subgroup.

Outcome	No depression (BDI-II <14)	Mild depression (BDI-II 14-19)	Moderate depression (BDI-II 20-28)	Severe depression (BDI-II ≥29)
n at baseline	248	87	84	55
Suicidal ideation, n/N (%)	4/156 (2.6)	5/52 (9.6)	5/48 (10.4)	12/32 (37.5)
Disease activity outcomes, mean (SD)				
DAS28-ESR	2.4 (1.4)	2.7 (1.6)	2.6 (1.6)	3.0 (1.7)
[n evaluated]	[153]	[48]	[53]	[29]
CDAI	8.1 (8.7)	9.0 (9.3)	8.9 (8.8)	10.8 (9.0)
[n evaluated]	[207]	[64]	[63]	[38]
PhGA, mean (SD)	20.0 (20.8)	21.9 (21.2)	20.7 (19.3)	28.3 (24.1)
[n evaluated]	[208]	[64]	[64]	[38]
Patient-reported outcomes				
BDI-II, mean (SD)	7.6 (7.2)	11.8 (9.3)	14.5 (9.8)	27.0 (12.9)
[n evaluated]	[125]	[39]	[39]	[26]
STAI-State anxiety, mean (SD)	36.9 (10.4)	39.6 (8.8)	41.8 (10.6)	50.8 (10.8)
[n evaluated]	[154]	[48]	[48]	[33]
STAI-Trait anxiety, mean (SD)	35.3 (10.4)	41.8 (9.8)	42.8 (10.5)	52.2 (9.6)
[n evaluated]	[147]	[49]	[47]	[32]
PGA, mean (SD)	26.4 (24.4)	26.7 (21.2)	32.2 (25.7)	38.5 (25.2)
[n evaluated]	[208]	[65]	[65]	[39]
HAQ-DI, mean (SD)	0.7 (0.7)	1.1 (0.7)	1.0 (0.7)	1.3 (0.7)
[n evaluated]	[181]	[61]	[55]	[37]
Fatigue, mean (SD)	34.4 (29.2)	49.0 (26.5)	47.7 (26.1)	62.0 (27.1)
[n evaluated]	[153]	[48]	[53]	[32]
Pain, mean (SD)	32.0 (26.9)	36.2 (25.2)	37.5 (25.4)	38.3 (29.2)
[n evaluated]	[155]	[48]	[52]	[32]
Sleep disturbance, mean (SD)	29.2 (28.4)	42.9 (26.6)	40.3 (26.4)	61.9 (31.2)
[n evaluated]	[153]	[47]	[53]	[32]

BDI-II: Beck Depression Inventory II; CDAI: Clinical Disease Activity Index; DAS28: Disease Activity Score based on 28 joint count; ESR: erythrocyte sedimentation rate; HAQ-DI: Health Assessment Questionnaire-Disability Index; PGA: patient global assessment; PhGA: physician global assessment; SD: standard deviation; STAI: State-Trait Anxiety Index.

Supplementary Table S4. Mixed models repeated measures analysis of DAS28-ESR and BDI-II over time (n=474).

Effect	Visit	Parameter estimate	Standard error	Degree of freedom	T value	*p*-value
Influence of DAS28-ESR on BDI-II						
Intercept		11.59	1.49	444	7.78	<0.0001
DAS28-ESR		0.69	0.28	444	2.42	0.016
Visit	2	0.29	1.62	444	0.18	0.86
	3	0.53	1.61	444	0.33	0.74
	4	0.27	1.64	444	0.17	0.87
	5	-1.72	1.64	444	-1.05	0.30
	6	-2.63	1.70	444	-1.54	0.12
DAS28-ESR x visit	2	-0.13	0.39	444	-0.33	0.74
	3	-0.26	0.40	444	-0.67	0.51
	4	-0.25	0.43	444	-0.58	0.56
	5	0.36	0.41	444	0.86	0.39
	6	0.60	0.42	444	1.42	0.16
Influence of BDI-II on DAS28-ESR						
Intercept		4.81	0.10	444	47.84	<0.0001
BDI-II		0.005	0.005	444	0.93	0.36
Visit	2	-2.07	0.13	444	-15.86	<0.0001
	3	-2.56	0.14	444	-17.80	<0.0001
	4	-2.75	0.14	444	-19.82	<0.0001
	5	-2.64	0.15	444	-17.23	<0.0001
	6	-2.75	0.17	444	-16.42	<0.0001
BDI-II x visit	2	0.02	0.01	444	2.36	0.02
	3	0.12	0.01	444	1.91	0.06
	4	0.02	0.01	444	1.93	0.05
	5	0.02	0.01	444	2.29	0.03
	6	0.04	0.01	444	3.48	0.0005

BDI-II: Beck Depression Inventory II; DAS28: Disease Activity Score based on 28 joint count; ESR, erythrocyte sedimentation rate.

Supplementary Table S5. Correlation constants for change from baseline to week 52 for BDI-II and individual components of DAS28-ESR and CDAI*.

Variable	Number of patients	r
ESR	161	0.04
TJC	229	-0.10
SJC	229	-0.04
PGA	220	0.28
PhGA	219	0.13

*DAS28-ESR includes TJC, SJC, ESR, and PGA; CDAI includes TJC, SJC, PGA, and PhGA.
BDI-II: Beck Depression Inventory II; CDAI: Clinical Disease Activity Index; DAS28: Disease Activity Score based on 28 joint count; ESR, erythrocyte sedimentation rate; ND: not determined; PhGA: physician global assessment; PGA, patient global assessment; SJC, swollen joint count; TJC, tender joint count.

Supplementary Table S6. Adverse event reports for all patients and for patient who completed or did not complete the BDI-II. Data are presented as number of patients (%) [number of events].

Adverse event	All patients (n=1155)	BDI-II Complete (n=474)	BDI-II Incomplete (n=681)
AEs	561 (48.6%) [1238]	227 (47.9) [529]	334 (49.0) [709]
SAEs	117 (10.1%) [176]	49 (10.3%) [77]	68 (10.0%) [99]
SAEs related to TCZ SC	28 (2.4%) [39]	15 (3.2%) [15]	13 (1.9%) [24]
Severe infections	17 (1.5%) [25]	6 (1.3%) [12]	11 (1.6%) [13]
AEs leading to therapy discontinuation	216 (18.7%) [291]	72 (15.2%) [86]	144 (21.1%) [205]

AE: adverse event; BDI-II: Beck Depression Inventory II; SAE: serious adverse event; SC: subcutaneous; TCZ: tocilizumab.