Online supplementary appendix

ONLINE SUPPLEMENTARY TABLES

Supplementary table S1. Content of the BIP TIC ERP and BIP TIC HRT modules for children and parents.

Module	BIP TIC ERP child	BIP TIC HRT child	BIP TIC ERP & HRT parent
1	Introduction*	Introduction*	Introduction
2	Information about tics*	Information about tics*	Common thoughts and feelings among parents
3	Response prevention	Awareness training	Praising the child
4	Response prevention Exposure	Competing response training	Reminding the child to use treatment strategies Identifying and changing triggers that may provoke tics
5	Response prevention Exposure	Awareness training Competing response training	Praising the child Reminding the child to use treatment strategies Identifying and changing triggers that may provoke tics
6	Response prevention Exposure Negative thoughts about tics	Awareness training Competing response training Negative thoughts about tics	Same as Module 5
7	Response prevention Exposure Talking about tics	Awareness training Competing response training Talking about tics	Same as Module 5

8	Response prevention Exposure Tics in school	Awareness training Competing response training Tics in school	Same as Module 5
9	Awareness training Competing response training Approaching end of treatment	Response prevention Exposure Approaching end of treatment	Same as Module 5
10	Relapse prevention End of treatment	Relapse prevention End of treatment	Relapse prevention End of treatment

Note: * = The content of these modules is largely the same in the two interventions. BIP TIC ERP = internet-delivered exposure and response prevention; BIP TIC HRT = internet-delivered habit reversal training.

Supplementary table S2. Treatment credibility. Three weeks into treatment, children and parents rated the question *"How much do you expect you/your child will improve with this treatment?"* on a scale from 1 (*"Not improve at all"*) to 5 (*"Improve much"*).

	BIP TIC ERP (*n*=12)		BIP TIC HRT (*n*=11)	
	Children	**Parents**	**Children**	**Parents**
Mean (SD)	3.67 (1.15)	3.17 (1.03)	3.55 (0.69)	3.36 (0.81)

Note: BIP TIC ERP = internet-delivered exposure and response prevention; BIP TIC HRT = internet-delivered habit reversal training; SD = standard deviation.

Supplementary table S3. Treatment satisfaction. At post-treatment, children and parents rated questions 1 and 2 on a scale from 1 (*"Very bad"*) to 5 (*"Very good"*), and question 3 on a scale from 1 (*"Treatment at a clinic"*) to 5 (*"Treatment via the internet"*).

	BIP TIC ERP (*n*=12)		BIP TIC HRT (*n*=11)	
	Children	**Parents**	**Children**	**Parents**
1. *"What did you think about the treatment?"*	4.25 (0.87)	4.17 (0.83)	3.91 (0.70)	4.09 (0.83)
2. *"Would you recommend the treatment to a friend with tics?"*	4.25 (1.14)	4.58 (0.67)	3.91 (1.30)	4.27 (0.79)
3. *"If you had been able to choose, would you have preferred seeing a therapist at a clinic or receiving treatment via the internet?"*	3.92 (1.00)	3.75 (1.29)	3.91 (1.14)	3.18 (1.47)

Note: All values are means (SD). BIP TIC ERP = internet-delivered exposure and response prevention; BIP TIC HRT = internet-delivered habit reversal training; SD = standard deviation.

Supplementary table S4. Secondary outcome measures for the BIP TIC ERP and BIP TIC HRT

groups at all measure points.

	BIP TIC ERP (*n*=12)			BIP TIC HRT (*n*=11)		
	Mean (SD) [A]	Within-group difference[B]	Within-group effect size[C]	Mean (SD) [A]	Within-group difference[B]	Within-group effect size[C]
		Coefficient (95% CI); *p*-value	Cohens' *d* (95% CI)		Coefficient (95% CI); *p*-value	Cohens' *d* (95% CI)
PTQ						
Total Tic Severity						
Baseline	43.50 (17.62)	-	-	39.73 (22.40)	-	-
Mid-treatment	26.83 (12.48)	-16.67 (-24.02 to -9.31); *p*<0.001*	1.09 (0.22 to 1.94)	32.10 (29.66)	-7.31 (-15.68 to 1.06); *p*=0.087	0.29 (-0.57 to 1.15)
Post-treatment	21.08 (12.30)	-22.42 (-29.77 to -15.06); *p*<0.001*	1.48 (0.55 to 2.37)	27.09 (25.59)	-12.64 (-20.75 to -4.53); *p*=0.002*	0.53 (-0.33 to 1.37)
3-month follow-up[D]	18.67 (13.06)	-24.83 (-32.19 to -17.48); *p*<0.001*	1.60 (0.66 to 2.52)	27.00 (22.05)	-12.73 (-20.84 to -4.62); *p*=0.002*	0.57 (-0.29 to 1.42)
6-month follow-up	24.50 (36.67)	5.83 (-7.77 to 19.43); *p*=0.401	-0.21 (-1.01 to 0.59)	23.82 (17.81)	-3.18 (-15.40 to 9.04); *p*=0.610	0.16 (-0.68 to 0.99)
12-month follow-up	18.25 (13.40)	-0.42 (-14.02 to 13.18); *p*=0.952	0.03 (-0.77 to 0.83)	33.00 (33.62)	6.00 (-6.22 to 18.22); *p*=0.336	-0.21 (-1.05 to 0.63)
Motor Tic Severity						
Baseline	28.50 (14.52)	-	-	28.45 (10.79)	-	-
Mid-treatment	17.25 (8.16)	-11.25 (-17.15 to -5.35); *p*<0.001*	0.96 (0.10 to 1.79)	21.30 (15.25)	-6.54 (-11.45 to -1.63); *p*=0.009*	0.55 (-0-33 to 1.41)
Post-treatment	14.83 (8.97)	-13.67 (-19.56 to -7.77); *p*<0.001*	1.13 (0.25 to 1.99)	16.91 (10.67)	-11.55 (-16.30 to -6.79); *p*<0.001*	1.08 (0.17 to 1.96)
3-month follow-up[D]	12.08 (8.26)	-16.42 (-22.31 to -10.52); *p*<0.001*	1.39 (0.48 to 2.28)	18.18 (11.32)	-10.27 (-15.03 to -5.52); *p*<0.001*	0.93 (0.04 to 1.80)
6-month follow-up	14.00 (19.53)	1.92 (-6.58 to 10.42); *p*=0.659	-0.13 (-0.93 to 0.67)	15.91 (11.40)	-2.27 (-7.37 to 2.83); *p*=0.383	0.20 (-0.64 to 1.04)
12-month follow-up	12.25 (9.91)	0.17 (-8.33 to 8.67); *p*=0.969	-0.02 (-0.82 to 0.78)	21.55 (14.24)	3.36 (-1.74 to 8.47); *p*=0.196	-0.26 (-1.10 to 0.58)
Vocal Tic Severity						
Baseline	15.00 (11.72)	-	-	11.27 (14.62)	-	-
Mid-treatment	9.58 (8.28)	-5.42 (-10.29 to -0.54); *p*=0.029*	0.53 (-0.29 to 1.34)	10.80 (15.80)	-0.79 (-6.61 to 5.03); *p*=0.791	0.03 (-0.83 to 0.89)
Post-treatment	6.25 (6.12)	-8.75 (-13.63 to -3.87); *p*<0.001*	0.94 (0.08 to 1.77)	10.18 (18.06)	-1.09 (-6.73 to 4.55); *p*=0.705	0.07 (-0.77 to 0.90)
3-month follow-up[D]	6.58 (7.09)	-8.42 (-13.29 to -3.54); *p*=0.001*	0.87 (0.02 to 1.70)	8.82 (14.30)	-2.45 (-8.10 to 3.19); *p*=0.394	0.17 (-0.67 to 1.01)
6-month follow-up	10.50 (17.48)	3.92 (-2.51 to 10.34); *p*=0.232	-0.29 (-1.10 to 0.51)	7.91 (10.34)	-0.91 (-9.25 to 7.43); *p*=0.831	0.07 (-0.76 to 0.91)
12-month follow-up	6.00 (7.54)	-0.58 (-7.01 to 5.84); *p*=0.859	0.08 (-0.72 to 0.88)	11.45 (23.12)	2.64 (-5.70 to 10.97); *p*=0.535	-0.14 (-0.97 to 0.70)

PUTS						
Baseline	23.08 (6.93)	-	-	22.73 (5.52)	-	-
Mid-treatment	22.08 (6.80)	-1.00 (-3.44 to 1.44); p=0.422	0.15 (-0.66 to 0.95)	19.40 (7.01)	-2.62 (-5.87 to 0.64); p=0.115	0.53 (-0.35 to 1.40)
Post-treatment	22.92 (6.33)	-0.17 (-2.61 to 2.27); p=0.893	0.03 (-0.78 to 0.83)	22.64 (8.96)	-0.09 (-3.24 to 3.06); p=0.955	0.01 (-0.82 to 0.85)
3-month follow-up[D]	21.33 (6.53)	-1.75 (-4.19 to 0.69); p=0.160	0.26 (-0.55 to 1.06)	20.64 (8.19)	-2.09 (-5.24 to 1.06); p=0.194	0.30 (-0.54 to 1.14)
6-month follow-up	22.92 (5.73)	1.58 (-0.49 to 3.66); p=0.135	-0.26 (-1.06 to 0.55)	21.73 (8.96)	1.09 (-1.05 to 3.23); p=0.317	-0.13 (-0.96 to 0.71)
12-month follow-up	22.83 (5.75)	1.50 (-0.58 to 3.58); p=0.157	-0.02 (-1.04 to 0.56)	21.73 (8.25)	1.09 (-1.05 to 3.23); p=0.317	-0.13 (-0.97 to 0.71)
GTS-QOL						
Baseline	23.50 (14.37)	-	-	28.27 (18.86)	-	-
Post-treatment	14.58 (10.33)	-8.92 (-17.27 to -0.57); p=0.036*	0.71 (-0.12 to 1.53)	29.18 (20.00)	0.91 (-5.46 to 7.28); p=0.780	-0.05 (-0.88 to 0.79)
3-month follow-up[D]	14.75 (15.15)	-8.75 (-17.10 to -0.40); p=0.040*	0.59 (-0.23 to 1.41)	21.55 (15.12)	-6.73 (-13.10 to -0.36); p=0.038*	0.39 (-0.46 to 1.23)
6-month follow-up	17.67 (18.19)	2.92 (-2.31 to 8.15); p=0.274	-0.17 (-0.97 to 0.63)	21.55 (15.08)	0.00 (-5.73 to 5.73); p=1.000	0.00 (-0.84 to 0.84)
12-month follow-up	19.92 (15.92)	5.17 (-0.06 to 10.40); p=0.053	-0.33 (-1.13 to 0.48)	21.45 (14.71)	-0.09 (-5.82 to 5.63); p=0.975	0.00 (-0.83 to 0.84)
OCI-CV						
Baseline	6.67 (4.64)	-	-	6.55 (7.22)	-	-
Post-treatment	7.83 (7.26)	1.17 (-0.82 to 3.15); p=0.249	-0.19 (-0.99 to 0.61)	8.91 (8.34)	2.36 (0.28 to 4.44); p=0.026*	-0.30 (-1.14 to 0.54)
3-month follow-up[D]	6.92 (7.37)	0.25 (-1.73 to 2.23); p=0.805	-0.04 (-0.84 to 0.76)	6.91 (7.69)	0.36 (-1.72 to 2.44); p=0.732	-0.05 (-0.88 to 0.79)
6-month follow-up	8.08 (8.52)	1.17 (-0.64 to 2.97); p=0.206	-0.15 (-0.95 to 0.66)	6.82 (7.61)	-0.09 (-1.91 to 1.73); p=0.922	0.01 (-0.82 to 0.85)
12-month follow-up	10.42 (8.83)	3.50 (1.69 to 5.31); p<0.001*	-0.43 (-1.24 to 0.38)	6.55 (6.07)	-0.36 (-2.19 to 1.46); p=0696	0.05 (-0.78 to 0.89)
CDI-S						
Baseline	1.83 (1.99)	-	-	4.00 (4.73)	-	-
Mid-treatment	1.17 (1.27)	-0.67 (-1.44 to 0.11); p=0.091	0.40 (-0.41 to 1.20)	3.60 (3.66)	0.23 (-0.99 to 1.45); p=0.715	0.09 (-0.76 to 0.95)
Post-treatment	0.83 (1.40)	-1.00 (-1.77 to -0.23); p=0.011	0.58 (-0.24 to 1.39)	4.36 (4.06)	0.36 (-0.82 to 1.55); p=0.547	-0.08 (-0.92 to 0.75)
3-month follow-up[D]	1.00 (1.28)	-0.83 (-1.61 to -0.06); p=0.035	0.50 (-0.32 to 1.31)	3.82 (3.06)	-0.18 (-1.37 to 1.00); p=0.763	0.05 (-0.79 to 0.88)
6-month follow-up	1.58 (2.27)	0.58 (-0.36 to 1.53); p=0.227	-0.32 (-1.12 to 0.49)	4.73 (4.13)	0.91 (-0.68 to 2.49); p=0.261	-0.25 (-1.09 to 0.59)
12-month follow-up	1.67 (2.31)	0.67 (-0.28 to 1.61); p=0.167	-0.36 (-1.16 to 0.45)	4.64 (4.84)	0.82 (-0.77 to 2.40); p=0.312	-0.20 (-1.04 to 0.64)

SMFQ						
Baseline	5.50 (3.66)	-	-	6.45 (5.91)	-	-
Mid-treatment	3.67 (2.46)	-1.83 (-3.51 to -0.15); p=0.033*	0.59 (-0.24 to 1.40)	7.30 (6.36)	1.87 (0.33 to 3.42); p=0.018*	-0.14 (-0.99 to 0.72)
Post-treatment	2.08 (3.34)	-3.42 (-5.10 to -1.74); p<0.001*	0.98 (0.12 to 1.82)	5.73 (5.66)	-0.73 (-2.23 to 0.77); p=0.341	0.13 (-0.71 to 0.96)
3-month follow-up[D]	4.08 (3.90)	-1.42 (-3.10 to 0.26); p=0.099	0.38 (-0.44 to 1.18)	7.00 (7.04)	0.55 (-0.95 to 2.04); p=0.475	-0.08 (-0.92 to (0.75)
6-month follow-up	3.83 (4.90)	-0.25 (-1.74 to 1.24); p=0.742	0.06 (-0.74 to 0.86)	7.45 (7.87)	0.45 (-1.29 to 2.20); p=0.609	-0.06 (-0.90 to 0.78)
12-month follow-up	3.92 (3.34)	-0.17 (-1.65 to 1.32); p=0.826	0.05 (-0.75 to 0.85)	7.00 (5.71)	0.00 (-1.74 to 1.74); p=1.000	0.00 (-0.84 to 0.84)
WSAS-Y (child)						
Baseline	7.42 (6.42)	-	-	7.18 (5.15)	-	-
Post-treatment	4.25 (5.24)	-3.17 (-6.39 to 0.05); p=0.054	0.54 (-0.28 to 1.35)	4.09 (4.89)	-3.09 (-5.15 to -1.03); p=0.003*	0.62 (-0.25 to 1.47)
3-month follow-up[D]	4.58 (5.45)	-2.83 (-6.05 to 0.39); p=0.085	0.48 (-0.34 to 1.28)	4.18 (3.66)	-3.00 (-5.06 to -0.94); p=0.004*	0.67 (-0.20 to 1.52)
6-month follow-up	5.08 (5.74)	0.50 (-1.37 to 2.37); p=0.599	-0.09 (-0.89 to 0.71)	4.45 (5.07)	0.27 (-2.65 to 3.20); p=0.855	-0.06 (-0.90 to 0.77)
12-month follow-up	3.83 (5.80)	-0.75 (-2.62 to 1.12); p=0.431	0.13 (-0.67 to 0.93)	4.91 (7.50)	0.73 (-2.20 to 3.65); p=0.626	-0.12 (-0.96 to 0.71)
WSAS-Y (parent)						
Baseline	8.83 (4.82)	-	-	8.64 (9.07)	-	-
Post-treatment	7.42 (5.00)	-1.42 (-4.41 to 1.57); p=0.353	0.29 (-0.52 to 1.09)	6.64 (7.38)	-2.00 (-4.53 to 0.53); p=0.121	0.24 (-0.60 to 1.08)
3-month follow-up[D]	5.92 (6.36)	-2.92 (-5.91 to 0.07); p=0.056	0.52 (-0.30 to 1.33)	6.82 (6.57)	-1.82 (-4.34 to 0.71); p=0.158	0.23 (-0.61 to 1.07)
6-month follow-up	6.08 (8.10)	0.17 (-2.82 to 3.15); p=0.913	-0.02 (-0.82 to 0.78)	8.45 (8.51)	1.64 (-1.08 to 4.35); p=0.238	-0.22 (-1.05 to 0.63)
12-month follow-up	4.83 (5.69)	-1.08 (-4.07 to 1.90); p=0.477	0.18 (-0.62 to 0.98)	6.82 (8.47)	0.00 (-2.72 to 2.72); p=1.000	0.00 (-0.84 to 0.84)
CGAS						
Baseline	58.25 (4.41)	-	-	55.64 (4.67)	-	-
Post-treatment	64.42 (7.08)	6.17 (3.99 to 8.34); p<0.001*	1.05 (0.18 to 1.89)[E]	58.73 (4.94)	3.09 (0.23 to 5.95); p=0.034*	0.64 (-0.22 to 1.49)[E]
3-month follow-up[D]	65.75 (6.11)	7.50 (5.33 to 9.67); p<0.001*	1.41 (0.49 to 2.30)[E]	61.18 (8.00)	5.55 (2.68 to 8.41); p<0.001*	0.85 (-0.04 to 1.71)[E]
6-month follow-up	66.75 (8.18)	1.00 (-0.93 to 2.93); p=0.310	0.14 (-0.66 to 0.94)[E]	62.09 (8.22)	0.91 (-1.23 to 3.05); p=0.404	0.11 (-0.73 to 0.95)[E]
12-month follow-up	66.33 (7.48)	0.58 (-1.35 to 2.52); p=0.554	0.09 (-0.72 to 0.89)[E]	61.82 (8.64)	0.64 (-1.50 to 2.77); p=0.560	0.08 (-0.76 to 0.91)[E]

Note: A = Observed means; B = Coefficients at post-treatment and at the 3-month follow-up compare with baseline, while coefficients at the 6-month and 12-month follow-ups compare with the 3-month follow-up; C = All Cohen's *d* effect sizes are calculated from observed data. Post-treatment and the 3-month follow-up effect sizes compare with baseline, while the 6-month and 12-month follow-up effect sizes compare with the 3-month follow-up. Effect sizes of 0.2, 0.5, and 0.8 are considered small, moderate, and large, respectively; D = Primary endpoint; E = Effect sizes are inverted, so that an increase in CGAS is equivalent to a positive effect size; * = Significant at an alpha level of 0.05.

Data is complete for all measures except for PTQ, PUTS, CDI-S and SMFQ, which is missing at mid-treatment in one participant in the BIP TIC HRT group.

BIP TIC ERP = internet-delivered exposure and response prevention; BIP TIC HRT = internet-delivered habit reversal training; CDI-S = Children's Depression Inventory – Short version; CGAS = Children's Global Assessment Scale; CI = confidence interval; GTS-QOL = Gilles de la Tourette Syndrome – Quality of Life Scale; OCI-CV = Obsessive Compulsive Inventory – Child version; PTQ = Parent Tic Questionnaire; PUTS = Premonitory Urge for Tics Scale; SD = standard deviation; SMFQ = Short Mood and Feelings Questionnaire – Parent version; WSAS-Y = Work and Social Adjustment Scale – Child/Parent version.

Supplementary table S5. Self-reported adverse events at mid-treatment and post-treatment for the BIP TIC ERP and BIP TIC HRT groups, according to the SMURF.
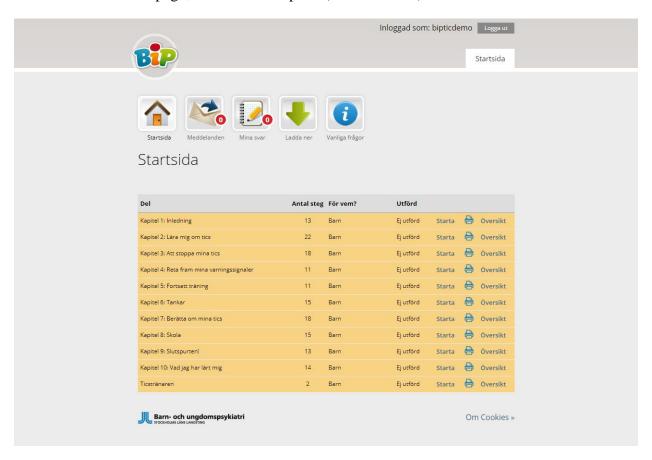
	BIP TIC ERP ($n = 12$)	BIP TIC HRT ($n = 11$)
Adverse events from baseline to mid-treatment		
Depressed mood, n (%)	1 (1)	5 (45)
Irritation/anger, n (%)	1 (1)	4 (36)
Increased tics, n (%)	3 (25)	2 (18)
Anxiety/worry, n (%)	2 (17)	2 (18)
Stress, n (%)	0 (0)	2 (18)
Tiredness, n (%)	1 (1)	1 (9)
Adverse events from mid-treatment to post-treatment		
Irritation/anger, n (%)	0 (0)	2 (18)
Depressed mood, n (%)	0 (0)	1 (9)
Stress, n (%)	0 (0)	1 (9)
Tiredness, n (%)	0 (0)	1 (9)
Pain, n (%)	0 (0)	1 (9)
Obsessions, n (%)	0 (0)	1 (9)
Concentration problems, n (%)	0 (0)	1 (9)

Note: BIP TIC ERP = internet-delivered exposure and response prevention; BIP TIC HRT = internet-delivered habit reversal training; SMURF = Safety Monitoring Uniform Report Form.
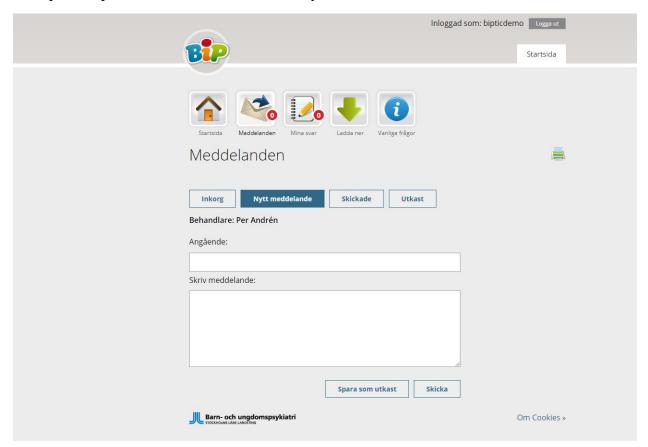
ONLINE SUPPLEMENTARY FIGURES

Supplementary figure S1. Screenshots from BIP TIC ERP and BIP TIC HRT.

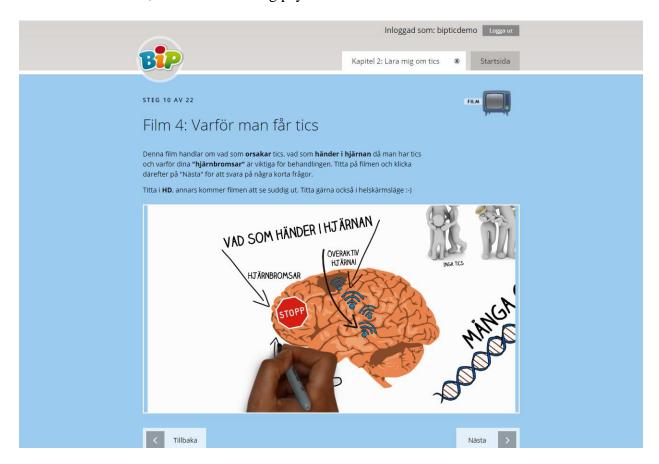1. Overview and start page, with list of chapters (BIP TIC ERP).

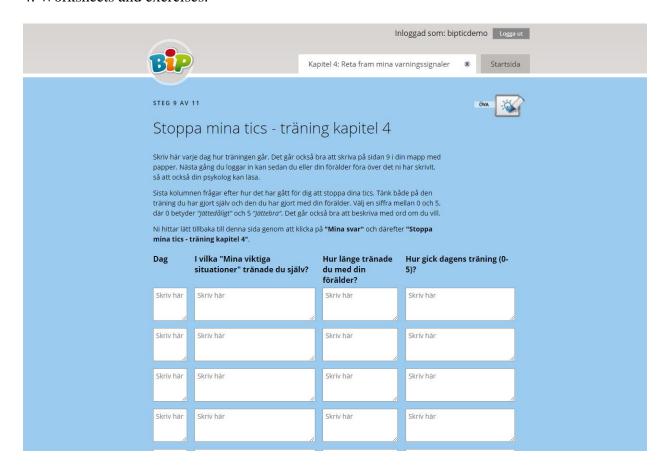2. Encrypted messaging function, where the participant can send messages to the therapist.

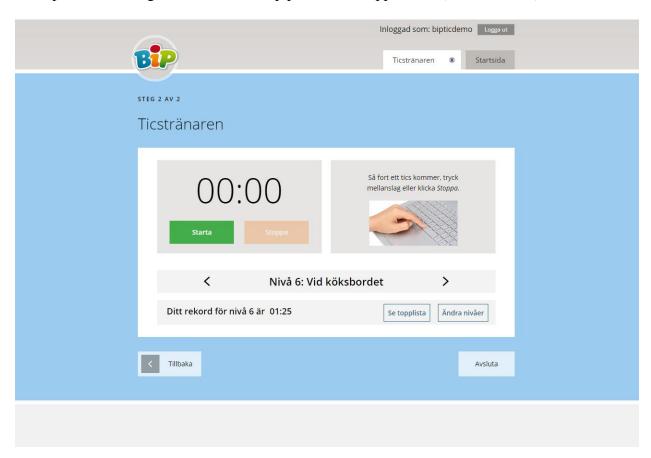Therapists respond within 24 hours on weekdays.

3. Educational films, used for delivering psychoeducation and the treatment rationale.
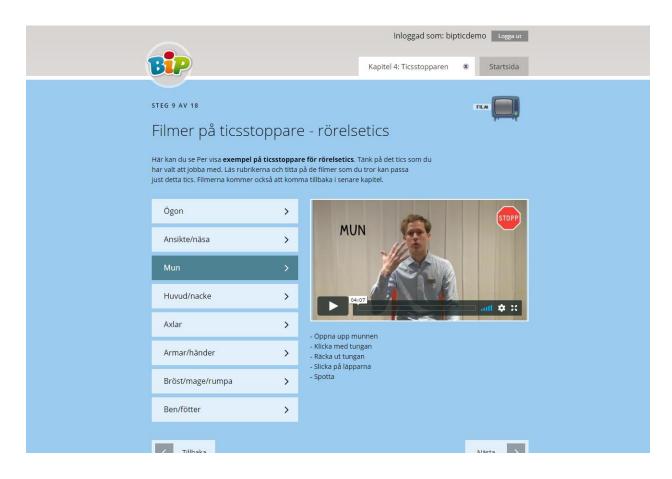
4. Worksheets and exercises.

BIP

Kapitel 4: Reta fram mina varningssignaler   ✕   Startsida

STEG 9 AV 11

ÖVA

Stoppa mina tics - träning kapitel 4

Skriv här varje dag hur träningen går. Det går också bra att skriva på sidan 9 i din mapp med papper. Nästa gång du loggar in kan sedan du eller din förälder föra över det ni har skrivit, så att också din psykolog kan läsa.

Sista kolumnen frågar efter hur det har gått för dig att stoppa dina tics. Tänk både på den träning du har gjort själv och den du har gjort med din förälder. Välj en siffra mellan 0 och 5, där 0 betyder *"Jättedåligt"* och 5 *"Jättebra"*. Det går också bra att beskriva med ord om du vill.

Ni hittar lätt tillbaka till denna sida genom att klicka på **"Mina svar"** och därefter **"Stoppa mina tics - träning kapitel 4"**.

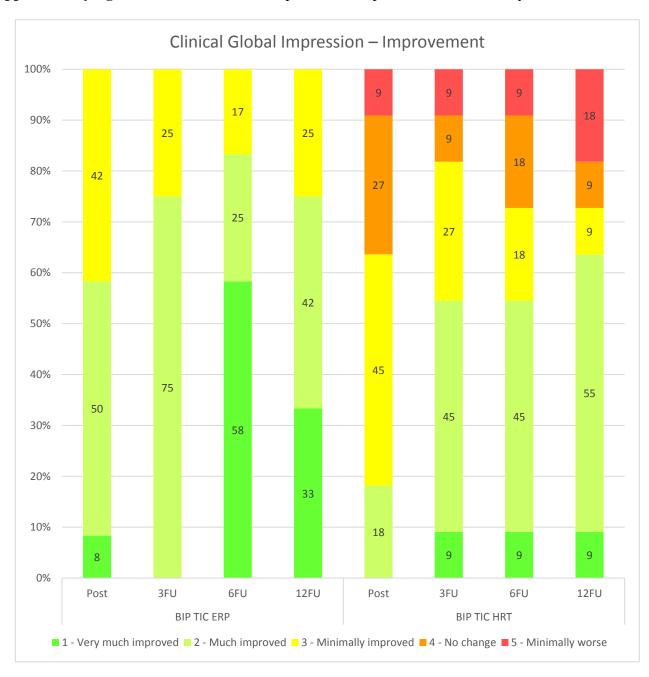| Dag	I vilka "Mina viktiga situationer" tränade du själv?	Hur länge tränade du med din förälder?	Hur gick dagens träning (0-5)?
Skriv här	Skriv här	Skriv här	Skriv här
Skriv här	Skriv här	Skriv här	Skriv här
Skriv här	Skriv här	Skriv här	Skriv här
Skriv här	Skriv här	Skriv här	Skriv här

5. Stopwatch with high score lists, to help practice tic suppression (BIP TIC ERP).
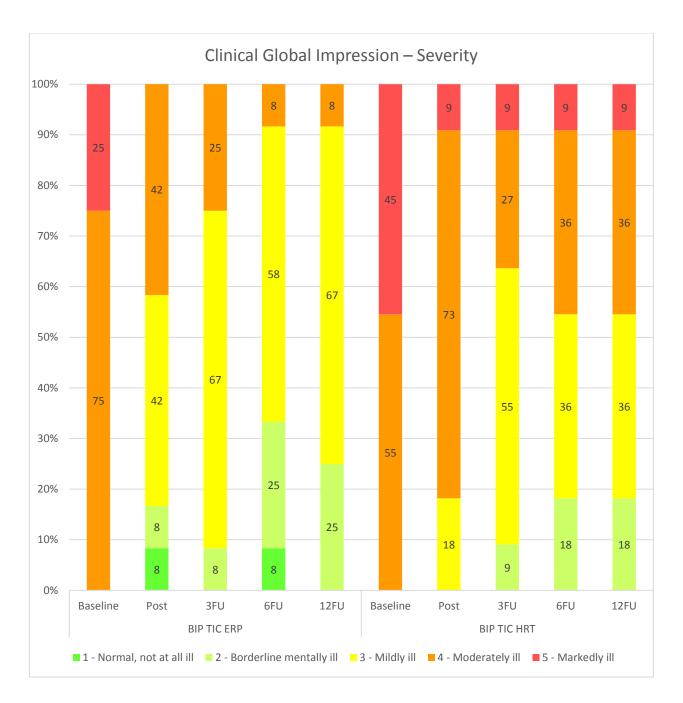
6. Films illustrating a wide range of competing responses (BIP TIC HRT).

Supplementary figure S2. Clinical Global Impression – Improvement and Severity.

Clinical Global Impression – Severity

Note: Percentage of participants. No participant was scored above 5 (Minimally worse/Markedly ill) in any of the scales. 3FU = 3-month follow-up; 6FU = 6-month follow-up; 12FU = 12-month follow-up; BIP TIC ERP = internet-delivered exposure and response prevention; BIP TIC HRT = internet-delivered habit reversal training; Post = Post-treatment.