

## Supplementary Online Content

Espie CA, Emsley R, Kyle SD, et al. Effect of digital cognitive behavioral therapy for insomnia on health, psychological well-being, and sleep-related quality of life: a randomized clinical trial. *JAMA Psychiatry*. Published online September 25, 2018.

doi:10.1001/jamapsychiatry.2018.2745

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This supplementary material has been provided by the authors to give readers additional information about their work.

**eTable 1.** Descriptives for participants who completed and who were lost to follow-up

	SHE + TAU (N= 858)		dCBT + TAU (N= 853)		Predicting missingness (p-value)
	Not Missing (N=505)	Missing (N=353)	Not Missing (N=464)	Missing (N=389)	Study arm p < 0.063
Age (Years)	49.7 (13.1)	44.7 (13.7)	51.2 (13.5)	45.2 (13.6)	< 0.001
Gender					
Male	95 (18.8%)	88 (24.9%)	99 (21.3%)	100 (25.7%)	0.009
Female	410 (81.2%)	265 (74.1%)	365 (78.7%)	289 (74.3%)	
Ethnicity					
Do not wish to state	5 (1.0%)	4 (1.1%)	3 (0.7%)	5 (1.3%)	0.356
Asian	11 (2.2%)	13 (3.7%)	8 (1.7%)	13 (3.3%)	
Black/African American	7 (1.4%)	5 (1.4%)	2 (0.4%)	5 (1.3%)	
White	455 (90.1%)	318 (90.3%)	438 (94.4%)	347 (89.2%)	
Mixed	12 (2.4%)	4 (1.1%)	9 (1.9%)	11 (2.8%)	
Other	15 (3.0%)	8 (2.7%)	4 (0.9%)	8 (2.1%)	
Height in cm	167.6 (9.3)	168.4 (9.6)	166.7 (9.2)	168.1 (9.5)	
Weight in kg	71.5 (19.4)	71.1 (15.1)	68.9 (15.2)	72.2 (17.2)	0.101
BMI	25.4 (6.6)	25.0 (4.9)	24.7 (4.7)	25.5 (5.5)	0.478
Partnership status					
No	135 (26.8%)	105 (29.8%)	104 (22.5%)	109 (28.1%)	0.011
Yes, living apart	33 (6.6%)	31 (8.8%)	36 (7.8%)	41 (10.6%)	
Yes, living together	336 (66.7%)	217 (61.5%)	322 (69.7%)	238 (61.3%)	
Children at home?					
No	339 (67.3%)	235 (66.8%)	326 (70.6%)	251 (64.5%)	0.155
Yes	165 (32.7%)	117 (33.2%)	136 (29.4%)	138 (35.5%)	
Age of youngest child at home	12.3 (7.3)	12.4 (8.0)	12.7 (7.3)	11.9 (8.0)	0.560
Employment status					
Full-time employed	212 (42.1%)	199 (56.7%)	203 (43.9%)	190 (49.1%)	<0.001
Part-time employed	130 (25.8%)	57 (16.2%)	93 (20.1%)	68 (17.6%)	
Unemployed	16 (3.2%)	18 (5.1%)	20 (4.3%)	20 (5.2%)	
Retired	96 (19.1%)	43 (12.3%)	105 (22.7%)	47 (12.1%)	
Full-time student	15 (3.0%)	17 (4.8%)	19 (4.1%)	28 (7.2%)	
Full-time homemaker or carer	35 (6.9%)	17 (4.8%)	22 (4.8%)	34 (8.8%)	
Years continuous full education	16.6 (3.5)	16.6 (3.6)	16.4 (3.8)	16.5 (4.0)	
Smoking how often					
Never, and never have	284 (56.5%)	187 (53.1%)	279 (60.3%)	204 (52.4%)	0.001
Never, but have previously	189 (37.6%)	120 (34.1%)	156 (33.7%)	141 (36.3%)	
Rarely	12 (2.4%)	17 (4.8%)	11 (2.3%)	20 (5.1%)	
1-10 a day	7 (1.4%)	12 (3.4%)	11 (2.4%)	17 (4.4%)	
11-20 a day	7 (1.4%)	12 (3.4%)	6 (1.3%)	7 (1.8%)	
21+ a day	4 (0.8%)	4 (1.1%)	0 (0.0%)	0 (0.0%)	
Alcohol how often					

Never	105 (20.8%)	95 (26.9%)	109 (23.5%)	96 (24.7%)	
Less than once a week	104 (20.6%)	79 (22.4%)	84 (18.1%)	70 (18.0%)	
Once a week	72 (14.3%)	44 (12.5%)	74 (16.0%)	53 (13.6%)	
2-3 times a week	139 (27.6%)	84 (23.8%)	115 (24.8%)	106 (27.3%)	
4+ times a week	84 (16.7%)	51 (14.5%)	81 (17.5%)	64 (16.5%)	0.366
Caffeine how often					
Never	61 (12.1%)	43 (12.3%)	48 (10.4%)	33 (8.5%)	
Less than once a day	64 (12.7%)	50 (14.3%)	68 (14.7%)	43 (11.1%)	
Once a day	110 (21.9%)	87 (24.8%)	99 (21.4%)	105 (27.1%)	
2-3 times a day	185 (36.8%)	120 (34.2%)	188 (40.7%)	142 (36.6%)	
4+ times a day	83 (16.5%)	51 (14.5%)	59 (12.8%)	65 (16.8%)	0.239
Exercise how often					
Never	44 (8.8%)	41 (11.6%)	32 (6.9%)	45 (11.6%)	
Less than once a week	58 (11.5%)	53 (15.0%)	42 (9.1%)	43 (11.1%)	
Once a week	81 (16.1%)	53 (15.0%)	62 (13.4%)	74 (19.0%)	
2-3 times a week	166 (33.0%)	113 (32.0%)	183 (39.5%)	134 (34.5%)	
4+ times a week	154 (30.6%)	93 (26.4%)	144 (31.1%)	93 (23.9%)	0.003
Diagnosed with heart disease or high blood pressure	72 (14.3%)	34 (9.6%)	71 (15.3%)	35 (9.0%)	0.001
Diagnosed with Diabetes	9 (1.8%)	9 (2.6%)	9 (1.9%)	9 (2.3%)	0.418
Diagnosed with stroke or other neurological problems	6 (1.2%)	2 (0.6%)	10 (2.2%)	6 (1.5%)	0.321
Diagnosed with cancer	29 (5.7%)	12 (3.4%)	26 (5.6%)	13 (3.4%)	0.027
Diagnosed with arthritis or other joint problems	59 (11.7%)	31 (8.8%)	49 (10.6%)	38 (9.8%)	0.215
Diagnosed with digestive disorders	77 (15.2%)	42 (11.9%)	68 (14.7%)	55 (14.2%)	0.266
Diagnosed with depression or anxiety	184 (36.4%)	149 (42.2%)	175 (37.7%)	142 (36.5%)	0.359
Diagnosed with hormonal problems	28 (5.5%)	29 (8.2%)	39 (8.4%)	31 (8.0%)	0.465
Other diagnosed comorbidity	80 (15.8%)	35 (9.9%)	79 (17.0%)	48 (12.3%)	0.002
No diagnosed comorbidity	139 (27.5%)	115 (32.6%)	132 (28.4%)	129 (33.2%)	0.021
Any diagnosed comorbidity	344 (71.1%)	226 (66.7%)	319 (70.7%)	242 (65.1%)	0.028
How many nights in last two weeks have taken prescribed sleeping medication	1.3 (3.0)	1.9 (3.9)	1.5 (3.5)	1.8 (3.9)	0.020
How many nights in last two weeks have taken non-prescribed sleeping medication	2.2 (3.8)	2.2 (3.8)	2.3 (4.0)	2.3 (4.1)	0.43
<u>Outcomes at Baseline</u>					
SCI-8	6.8 (3.3)	6.3 (3.2)	6.9 (3.2)	6.1 (3.3)	<0.001
SCI-9	7.8 (3.6)	7.3 (3.8)	7.7 (3.6)	7.1 (3.7)	0.004

GSII						
Bothered by most important concern	87.0 (12.4)	87.7 (13.2)	86.8 (12.6)	88.9 (13.0)	0.022	
Bothered by 2 <sup>nd</sup> most important concern	75.0 (16.2)	76.0 (16.7)	74.7 (17.1)	78.2 (17.4)	0.005	
Bothered by 3 <sup>rd</sup> most important concern	60.5 (21.0)	59.6 (21.5)	59.1 (21.2)	62.9 (21.5)	0.152	
Combined score	222.5 (43.9)	223.3 (45.5)	220.6 (45.8)	230.0 (45.7)	0.018	
ESS	6.5 (4.5)	5.7 (4.4)	6.1 (4.4)	6.1 (4.4)	0.087	
FFS	18.9 (5.4)	19.3 (5.3)	18.7 (5.2)	19.3 (5.8)	0.046	
PROMIS-10						
Physical	14.3 (2.1)	14.4 (2.3)	14.6 (2.2)	14.1 (2.3)	0.083	
Mental	11.5 (3.0)	11.1 (3.1)	11.5 (3.1)	10.9 (2.9)	0.001	
Total	31.9 (5.5)	31.7 (5.8)	32.5 (5.9)	31.1 (5.7)	0.003	
WEMWBS	43.7 (7.8)	42.5 (7.9)	44.0 (7.9)	42.1 (7.4)	<0.001	
PHQ-9	9.6 (4.2)	10.0 (4.0)	9.2 (4.0)	10.4 (4.1)	<0.001	
GAD-7	7.2 (4.5)	7.8 (4.9)	6.9 (4.5)	7.9 (4.8)	<0.001	
RAS	27.9 (5.8)	27.1 (5.8)	28.0 (5.7)	27.6 (5.9)	0.084	
CFQ	42.4 (15.8)	42.7 (18.1)	42.4 (15.8)	43.9 (14.9)	0.26	
WPAI						
Absenteeism due to Sleep score	8.0 (18.2)	8.1 (15.1)	6.9 (15.8)	7.9 (16.9)	0.022	
Absenteeism due to other factors score	4.1 (13.4)	4.4 (13.4)	4.8 (13.5)	4.3 (13.5)	0.005	
Impact on productivity at work score	38.5 (23.4)	44.3 (22.5)	40.9 (23.4)	43.6 (24.5)	0.152	
Impact on productivity in general score	43.9 (24.0)	47.3 (24.8)	43.5 (24.6)	47.4 (25.4)	0.018	
Job satisfaction	3.5 (2.1)	3.8 (1.9)	3.3 (2.1)	3.6 (2.0)	0.010	
Life satisfaction	2.9 (0.7)	2.7 (0.7)	2.8 (0.7)	2.8 (0.7)	0.005	
How many times visiting a GP in the past month	0.5 (0.8)	0.6 (0.9)	0.6 (0.7)	0.6 (1.0)	0.029	
How many times visiting a specialist in the past month	0.3 (0.7)	0.3 (0.8)	0.3 (0.7)	0.3 (0.7)	0.395	
How many times in an emergency room in the past month	0.03 (0.2)	0.05 (0.2)	0.03 (0.2)	0.05 (0.3)	0.146	
How many times staying in a hospital overnight or longer in the past month	0.01 (0.1)	0.01 (0.1)	0 (0)	0.01 (0.1)	0.153	
How many total nights spent in the hospital in the past month	0.2 (0.3)	0.351	0.004 (0.07)	0.03 (0.3)	0.351	
*Data are either frequency (%) or mean (standard deviation (sd)) as stated						

PROMIS-10: Patient Reported Outcome Measure, 10 item version; GSII: Glasgow Sleep Impact Index; SCI: Sleep condition Indicator; PHQ-9: Patient Health Questionnaire, 9 items;

GAD-7: Generalized Anxiety Disorder, 7 items; FFS: Flinders Fatigue Scale; RAS: relationship Assessment Scale, CFQ: Cognitive Failures Questionnaire, WPAI: Work Productivity and Activity Impairment; ESS: Epworth Sleepiness Scale; SE: Standard Error; CI: Confidence Interval; SHE: Sleep Hygiene Education; dCBT: digital Cognitive Behavioral Therapy; TAU: Treatment as Usual.

**eTable 2.** Mediation analyses on PROMIS subscales and GSII total score, and 2nd and 3rd ranked complaints

		Mediation tested	Total effect			Direct effect			Indirect effect			% mediated
			Effect size	SE	p value	Effect size	SE	p value	Effect size	SE	p value	
PROMIS-10	Week 8	SCI Week 4	0.68	0.11	<0.0001	0.28	0.11	0.0139	0.32	0.04	<0.0001	46.98
Physical	Week 24	SCI Week 8	0.59	0.11	<0.0001	0.04	0.12	0.7147	0.51	0.05	<0.0001	86.41
PROMIS-10	Week 8	SCI Week 4	0.81	0.15	<0.0001	0.31	0.15	0.0422	0.41	0.06	<0.0001	50.93
Mental	Week 24	SCI Week 8	0.85	0.15	<0.0001	0.07	0.16	0.6583	0.71	0.07	<0.0001	83.28
GSII Rank 2	Week 8	SCI Week 4	-17.30	1.60	<0.0001	-8.57	1.58	<0.0001	-7.50	0.88	<0.0001	43.3
	Week 24	SCI Week 8	-19.79	1.65	<0.0001	-9.41	1.65	<0.0001	-11.79	0.91	<0.0001	59.6
GSII Rank 3	Week 8	SCI Week 4	-15.43	1.60	<0.0001	-7.91	1.61	<0.0001	-6.68	0.81	<0.0001	43.3
	Week 24	SCI Week 8	-18.82	1.65	<0.0001	-9.63	1.70	<0.0001	-10.71	0.87	<0.0001	56.9
GSII Total	Week 8	SCI Week 4	-50.09	4.26	<0.0001	-25.25	4.11	<0.0001	-22.08	2.53	<0.0001	44.1
	Week 24	SCI Week 8	-57.19	4.40	<0.0001	-26.92	4.27	<0.0001	-34.69	2.59	<0.0001	60.7

PROMIS-10: Patient Reported Outcome Measure, 10 item version; GSII: Glasgow Sleep Impact Index; SCI: Sleep condition Indicator.

**eTable 3.** Mediation effects for secondary outcomes

		Mediation tested	Total effect			Direct effect			Indirect effect			% mediated
			Effect size	SE	p value	Effect size	SE	p value	Effect size	SE	p value	
PHQ-9	Week 8	SCI Week 4	-1.59	0.23	<0.0001	-0.53	0.23	0.0221	-0.83	0.11	<0.0001	51.95
	↓ Week 24	SCI Week 8	-1.58	0.24	<0.0001	-0.03	0.24	0.8962	-1.53	0.12	<0.0001	96.93
GAD-7	Week 8	SCI Week 4	-1.18	0.23	<0.0001	-0.57	0.24	0.0179	-0.52	0.08	<0.0001	44.07
	Week 24	SCI Week 8	-1.09	0.23	<0.0001	-0.05	0.25	0.8428	-1.03	0.10	<0.0001	94.30
ESS	Week 8	SCI Week 4	-1.00	0.19	<0.0001	-0.78	0.20	0.0001	-0.29	0.06	0.0009	28.60
	Week 24	SCI Week 8	-1.40	0.19	<0.0001	-0.87	0.22	<0.0001	-0.61	0.08	<0.0001	43.35
FFS	Week 8	SCI Week 4	-3.82	0.33	<0.0001	-2.12	0.32	<0.0001	-1.56	0.18	<0.0001	40.76
	Week 24	SCI Week 8	-4.03	0.34	<0.0001	-1.75	0.34	<0.0001	-2.50	0.19	<0.0001	61.98
RAS	Week 8	SCI Week 4	0.07	0.26	0.7810	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Week 24	SCI Week 8	0.01	0.27	0.9760	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CFQ	Week 8	SCI Week 4	-4.16	0.61	<0.0001	-3.21	0.66	<0.0001	-0.78	0.20	<0.0001	18.71
	Week 24	SCI Week 8	-3.36	0.62	<0.0001	-2.02	0.71	0.0046	-1.54	0.26	<0.0001	45.92
WPAI	Week 8	SCI Week 4	-9.40	1.69	<0.0001	-5.23	1.76	0.0030	-3.71	0.64	<0.0001	39.46
Presenteeism	Week 24	SCI Week 8	-9.85	1.76	<0.0001	-4.97	1.86	0.0074	-5.48	0.69	<0.0001	55.67
WPAI	Week 8	SCI Week 4	-1.13	0.91	0.2132	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Absenteeism	Week 24	SCI Week 8	-1.99	0.94	0.0353	-1.51	1.01	0.1349	-0.62	0.26	0.0171	31.15
Job	Week 8	SCI Week 4	0.08	0.09	0.3850	n/a	n/a	n/a	n/a	n/a	n/a	n/a
satisfaction	Week 24	SCI Week 8	0.27	0.09	0.0044	0.14	0.10	0.1661	0.07	0.03	0.0196	25.72
Life	Week 8	SCI Week 4	0.12	0.04	0.0008	0.05	0.04	0.18	0.06	0.01	<0.0001	45.90
Satisfaction	Week 24	SCI Week 8	0.16	0.04	<0.0001	0.08	0.04	0.0596	0.08	0.01	<0.0001	55.90

PHQ-9: Patient Health Questionnaire, 9 items; GAD-7: Generalized Anxiety Disorder, 7 items; FFS: Flinders Fatigue Scale; RAS: relationship Assessment Scale, CFQ: Cognitive Failures Questionnaire, WPAI: Work Productivity and Activity Impairment; ESS: Epworth Sleepiness Scale; SE: Standard Error; CI: Confidence Interval; SHE: Sleep Hygiene Education; dCBT: digital Cognitive Behavioral Therapy; TAU: Treatment as Usual.

**eTable 4.** Frequency of adverse events by treatment group

	dCBT + TAU (N=458)	SHE + TAU (N=493)	p-value
	N (%)		Chi-square test
Low mood	99 (21.6)	102 (20.7)	0.7276
Fatigue and/or exhaustion	212 (46.3)	133 (27.0)	<0.0001
Extreme sleepiness	141 (30.8)	70 (14.2)	<0.0001
Feeling agitated	83 (18.1)	83 (16.8)	0.6015
Difficulty remembering things	88 (19.2)	72 (14.6)	0.0576
Bodily pain	54 (11.8)	58 (11.8)	0.9902
Headache and/or migraine	86 (18.8)	62 (12.6)	0.0084
Euphoria and/or intense increase in mood	17 (3.71)	12 (2.43)	0.2522
Difficulty concentrating and focussing on things	152 (33.2)	94 (19.1)	<0.0001
Reduced motivation and/or energy	150 (32.8)	119 (24.1)	0.0032
Changes in hunger and/or appetite	48 (10.5)	39 (7.93)	0.1727
Blurred vision	21 (4.59)	21 (4.26)	0.8071
Dizziness	30 (6.55)	19 (3.85)	0.0602
Feeling irritable	129 (28.2)	88 (17.9)	0.0002

dCBT: digital Cognitive Behavioral Therapy; TAU: Treatment as Usual; SHE: Sleep Hygiene Education.