

Supplement to: Group Cognitive Behavioural Therapy for Non-Rapid Eye Movement Parasomnias: Long-term Outcomes and Impact of COVID-19 Lockdown

Supplement Outline

1. Methods and Protocol
2. ICL Questionnaire
3. Supplementary Results

1. Methods and Protocol

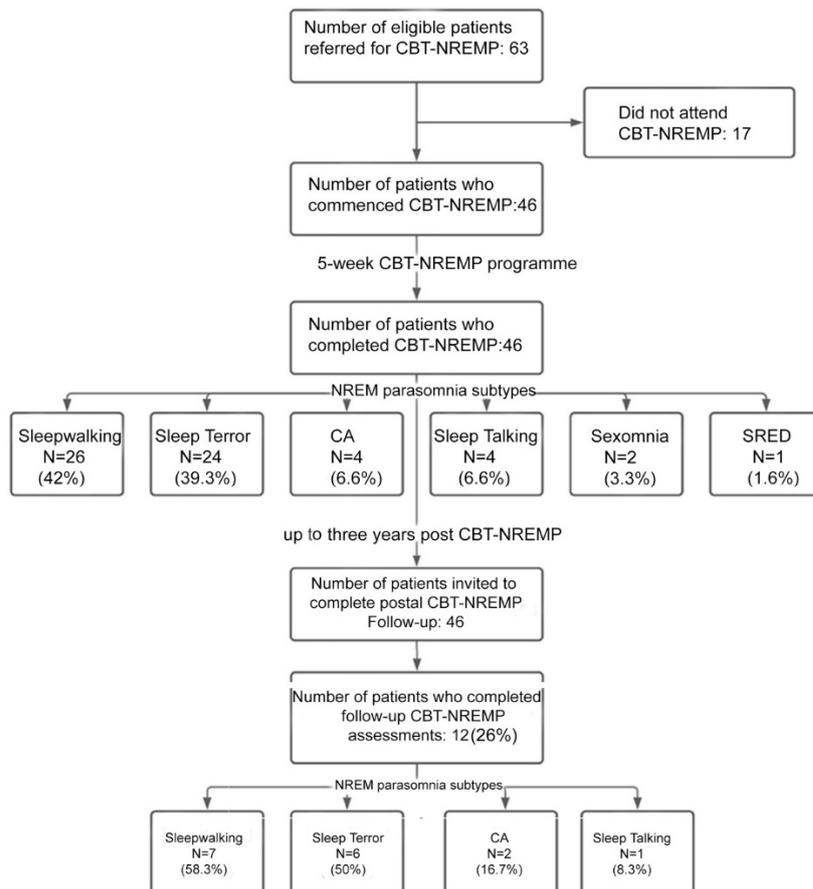


Figure S1. Flowchart of the studied cohort of patients with NREM parasomnia. Some patients reported N>1 subtype of NREM parasomnia. Percentages indicate the prevalence of each NREM parasomnia subtype in our cohort. CBT-NREMP: Cognitive Behavioural Therapy for NREM parasomnia; CA: confusional arousal; SRED: sleep-related eating disorder; NREM: non-REM; N: number.

2. Impact of COVID-19 Lockdown on NREM Parasomnias Questionnaire (ICL)

Questionnaire S1. IMPACT of COVID-19 lockdown on NREM Parasomnias Questionnaire

The purpose of this questionnaire is to understand if COVID-19 lockdown impacted your NREM parasomnias in any way. Please complete the questionnaire based on your overall experience of the COVID-19 lockdown to date. If a question is non-applicable to you, please circle the 'no change' option, or write N/A in the margin.

Starting Questions - please circle the best option for you

Did you contract Covid-19?: yes/no

If yes, did you require hospital treatment?: yes/no

Were you home confined during lockdown (i.e. Did you work from home; remain essentially housebound)?:
yes/no

Were you classified as an essential worker during lockdown (e.g. healthcare, police, fire service, or in a job that is COVID-19 essential?): yes/no

Did you live alone during lockdown? yes/no

Sleep

My NREM parasomnias deteriorated during lockdown (e.g. my sleepwalking became more frequent)

Strongly Disagree				No Change						Strongly Agree
1	2	3	4	5	6	7	8	9	10	

My sleep overall deteriorated during lockdown

Strongly Disagree				No Change						Strongly Agree
1	2	3	4	5	6	7	8	9	10	

Lockdown continues to adversely affect my sleep

Strongly Disagree				No Change						Strongly Agree
1	2	3	4	5	6	7	8	9	10	

During lockdown, ...

A. It took me longer to fall asleep

Strongly Disagree				No Change						Strongly Agree
1	2	3	4	5	6	7	8	9	10	

B. I was awake for more of the night

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

C. I found it difficult to get up on time

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

D. I napped more during the day

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

E. My sleep quality overall was poorer

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

F. I felt more tired and fatigued during the day

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

G. It was more difficult to switch off my mind at night

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

Mental Health

I feel that my overall mental health deteriorated during lockdown

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

I felt anxious during lockdown

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

I felt depressed during lockdown

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

I felt more stressed during lockdown

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

General wellbeing and lifestyle

My ability to engage in exercise during lockdown reduced

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

My alcohol consumption increased during lockdown

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

My use of illicit substances (e.g. cannabis, cocaine, LSD etc) increased during lockdown

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

My diet deteriorated during lockdown (e.g. I gained weight and/or ate more unhealthily)

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

I felt lonely during lockdown

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

Lockdown affected my family and social relationships

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

My ability to connect and communicate with others deteriorated during lockdown

Strongly Disagree				No Change					Strongly Agree
1	2	3	4	5	6	7	8	9	10

I have been adversely affected financially due to lockdown

Strongly Disagree 1 2 3 4 No Change 5 6 7 8 9 Strongly Agree 10

Working from home adversely affected my general wellbeing

Strongly Disagree 1 2 3 4 No Change 5 6 7 8 9 Strongly Agree 10

My responsibilities increased during lockdown e.g. I had to homeschool my children

Strongly Disagree 1 2 3 4 No Change 5 6 7 8 9 Strongly Agree 10

The ill effects of lockdown are still impacting my general wellbeing

Strongly Disagree 1 2 3 4 No Change 5 6 7 8 9 Strongly Agree 10

3. Supplementary Results

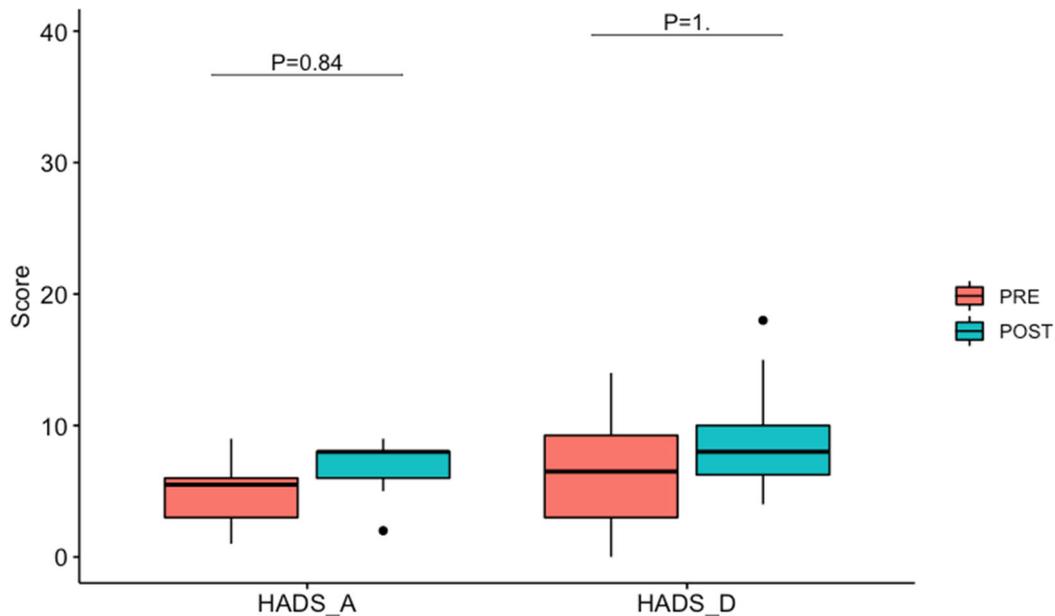


Figure S2. Box plot of Assessment Score for PRE (after the CBT-NREMP intervention) and during lockdown (POST) for HADS components (note: P values are from Wilcoxon tests). PRE: post CBT-NREMP treatment; POST: follow-up. Box represents the 50% of the central data (between 25th and 75th percentiles), with a line inside that

represents the median. Dots represent points outside 1.5 times the interquartile range above the upper quartile and below the lower quartile.

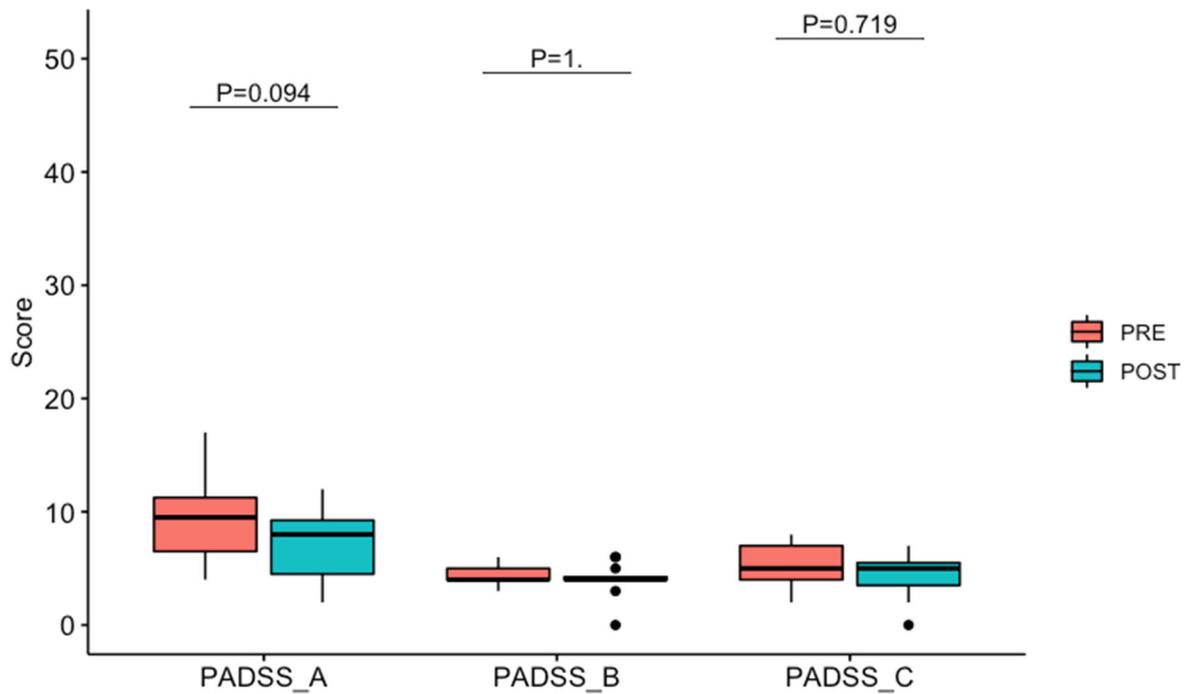


Figure S3. Box plot of Assessment Score for PRE and POST for PADSS components (note: p values are from Wilcoxon tests). PRE: post CBT-NREMP treatment; POST: follow-up. Box represents the 50% of the central data (between 25th and 75th percentiles), with a line inside that represents the median. Dots represent points outside 1.5 times the interquartile range above the upper quartile and below the lower quartile.

Table S1. Pairwise comparison of pre-treatment, post-treatment and the current follow-up (lockdown) time points for scales of ISI, HADS, and PADSS using Wilcoxon signed rank test along with the adjusted p values for multiple tests using Bonferroni correction.

		Wilcoxon signed rank test statistics	P value	Adjusted p value
Pre- (before CBT-NREMP intervention) vs Post- (after CBT-NREMP intervention) treatment comparison				
ISI	ISI	42.5	0.137	1
HADS	HADS	49.5	0.432	1
HADS_A	HADS_A	37	0.353	1
HADS_D	HADS_D	41.5	0.475	1
PADSS	PADSS	38.5	0.281	1
PADSS_A	PADSS_A	33.5	0.207	1
PADSS_B	PADSS_B	1.5	1	1
PADSS_C	PADSS_C	18.5	0.667	1
Pre-(before CBT-NREMP intervention) vs Current F/U (postal survey) comparison				
ISI	ISI	51	0.365	1
HADS	HADS	17.5	0.332	1
HADS_A	HADS_A	1.5	0.073	1
HADS_D	HADS_D	22.5	0.646	1
PADSS	PADSS	52.5	0.012*	0.295
PADSS_A	PADSS_A	65	0.005*	0.119
PADSS_B	PADSS_B	3	0.371	1
PADSS_C	PADSS_C	26	0.049	1
Post-(after CBT-NREMP intervention) vs Current F/U (postal survey) comparison				
ISI	ISI	42	0.844	1
HADS	HADS	11	0.102	1
HADS_A	HADS_A	6	0.105	1
HADS_D	HADS_D	12	0.438	1
PADSS	PADSS	50	0.024*	0.583
PADSS_A	PADSS_A	52.5	0.012*	0.283
PADSS_B	PADSS_B	6	0.174	1
PADSS_C	PADSS_C	19	0.09	1

Abbreviations: CBT-NREMP, Cognitive Behavioural Therapy for Non-REM parasomnia; F/U, follow-up (i.e. the current postal survey); ISI, Insomnia Severity Index; PADSS, Paris Arousal Disorders Severity Scale (total score); PADSS-A, Paris Arousal Disorders Severity Scale-subset A score; PADSS-B; Paris Arousal Disorders Severity Scale subset-B score; PADSS-C, Paris Arousal Disorders Severity Scale subset-C score; HADS, Hospital Anxiety and Depression Scale (total score); HADS-A, Hospital Anxiety and Depression Scale-Anxiety subset score; HAD-D, Hospital Anxiety and Depression Scale - Depression subset score. Statistically significant values are shown. *Wilcoxon signed rank test, along with adjusted p values for multiple tests using Bonferroni correction.

Table S2. Impact of Covid-19 Lockdown on depression, anxiety and each of the sleep-related scores (as measured via the ICLQ), using one sample Wilcoxon signed-rank test.

Variables	Z -Score	P-Value < 0.05
NREM parasomnia deteriorated	2.274	0.023
Sleep deteriorated	1.791	0.073
Lockdown continues to adversely affect my sleep	0.060	0.952
Increased sleep onset latency	-0.085	0.932
Increased wake-after-sleep-onset	0.000	1.000
Difficult to rise on time	2.506	0.012
Increased excessive daytime somnolence	-0.120	0.905
Poor sleep quality	1.521	0.128
Increased daytime tiredness	2.039	0.041
Overactive mind at night	2.620	0.009
Mental health deteriorated	1.655	0.098
Increased anxiety	2.210	0.027
Increased depression	1.299	0.194
Increased stress	2.032	0.042
Reduced engagement with exercise	0.861	0.389
Increased alcohol consumption	1.590	0.112
Increased illicit substance use	-2.222	0.026
My diet deteriorated	2.070	0.038
Increased loneliness	0.568	0.570
Relationships were adversely affected	1.206	0.228
Ability to communicate with others were adversely affected	1.206	0.228
Finances were adversely affected	0.060	0.952
Working from home had a negative impact on my general wellbeing	1.478	0.139
My responsibilities increased	-0.085	0.932
The negative effects of lockdown continue to impact my general wellbeing	0.981	0.327

Abbreviations: ICLQ = Impact of COVID-19 Lockdown Questionnaire.

A one-sample Wilcoxon signed-rank test revealed significant effects across eight items. The main effects were primarily observed in the questionnaire's sleep subscale, where lockdown measures were shown to contribute to: the deterioration of NREM parasomnia ($P = .023$; $M = 6.5$; Table 4, Figure 3), patients' ability to wake up on time and sleep inertia ($P = .012$; $M = 7$), additional tiredness during the day or excessive daytime somnolence ($P = .041$; $M = 7$) and difficulties switching the mind off at night or hypervigilance ($P = .009$; $M = 7.5$; Table 4, Figure 4). Moreover, congruent with these scores, in the mental health, general wellbeing and lifestyle subscales, patients also reported: elevated levels of anxiety during lockdown ($P = .027$; $M: 7$; Tables 3, 4, Figure 4), increased amount of stress ($P = .042$ $M: 8$), dietary deterioration ($P = .038$; $M: 7$), but lower levels of illicit substance use ($P = .026$; $M: 4.5$). *Statistically significant results are indicated in bold*

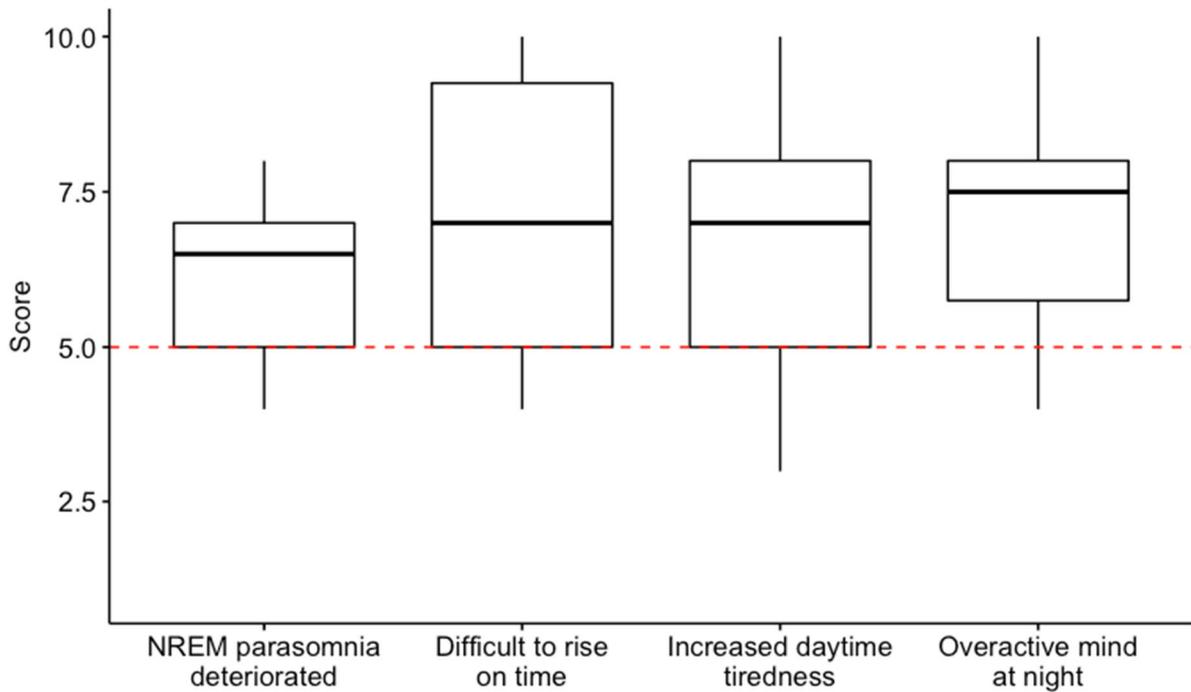


Figure S4. Box plot of significant effects observed in sleep subscales. *Red dotted line indicates a score of five which indicates no change in effect.* Box represents the 50% of the central data (between 25th and 75th percentiles), with a line inside that represents the median. Dots represents points outside 1.5 times the interquartile range above the upper quartile and below the lower quartile.

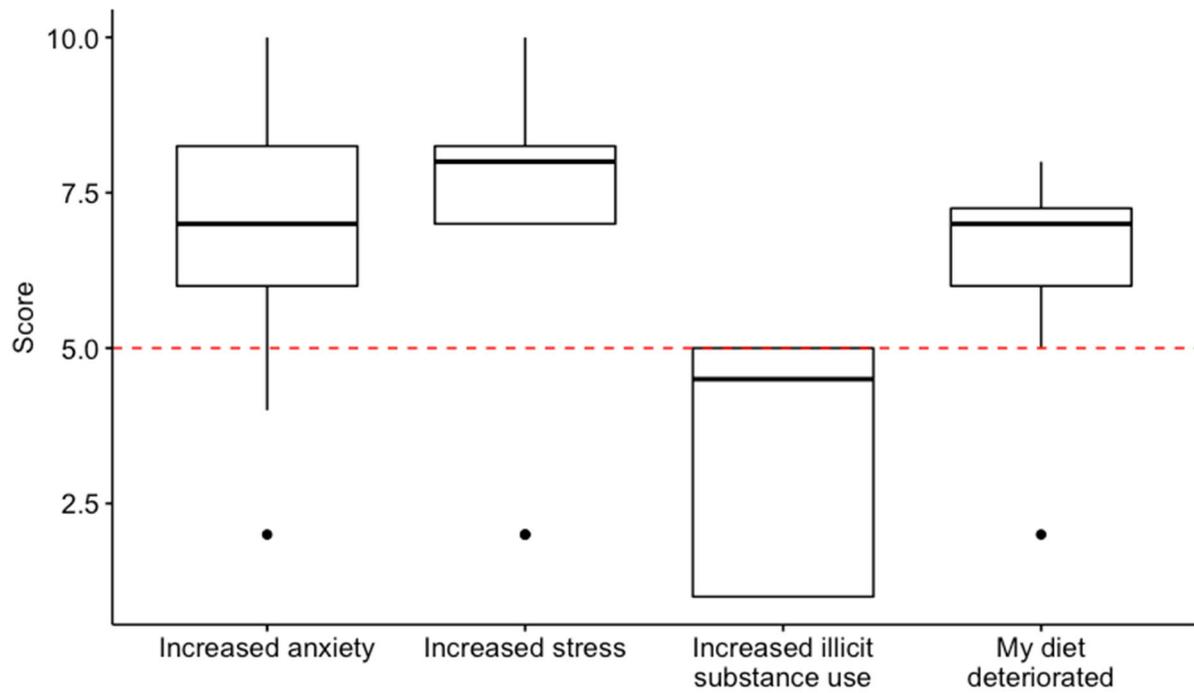


Figure S5. Box plot of significant effects observed in mental health, general wellbeing and lifestyle subscales. *Red dotted line indicates a score of five which indicates no change in effect.* Box represents the 50% of the central data (between 25th and 75th percentiles), with a line inside that represents the median. Dots represents points outside 1.5 times the interquartile range above the upper quartile and below the lower quartile.