The Transdiagnostic Intervention for Sleep and Circadian Dysfunction (TSC) in Community Mental Health: Evaluating Self-Reported Psychiatric Disorders as a Predictor of Symptoms and Treatment Outcome

Supplementary Material

Journal name: *Administration and Policy in Mental Health and Mental Health Services Research*

Supplementary Table 1. Descriptions of Cross-cutting, Core, and Optional Modules Offered for the Standard and Adapted Conditions

Cross-cutting modules: Case formulation, Sleep and circadian education, Motivational enhancement, Goal setting

Standard	Adapted
Core modules	
Core Module 1a: Targets irregular sleep-wake times	*Core Module 1*: Targets irregular sleep-wake times
Core Module 1b: Targets difficulty winding down	*Core Module 2*: Targets difficulty winding down
Core Module 1c: Targets difficulty waking up	*Core Module 3*: Targets difficulty waking up
Core Module 2: Aims to reduce daytime impairment	*Core Module 4*: Aims to reduce daytime impairment
Core Module 3: Focuses on unhelpful beliefs about sleep	*Core Module 5*: Promotes maintenance of change
Core Module 4: Promotes maintenance of change	--
Optional modules	
Optional Module 1: Addresses poor sleep efficiency via stimulus control and sleep restriction	*Optional Module 1*: Focuses on reducing sleep-related worry
Optional Module 2: Helps patients reduce time in bed	--
Optional Module 3: Addresses delayed or advanced phase problems (e.g., going to sleep later than desired or waking up earlier than desired)	--
Optional Module 4: Focuses on reducing sleep-related worry	--
Optional Module 5: Promotes compliance with Continuous Positive Airways Pressure (CPAP) for patients with sleep apnea	--
Optional Module 6: Helps patients negotiate sleep in complicated environments (e.g., noise from bed/roommates, traffic noise, streetlight entering the bedroom)	--
Optional Module 7: Helps patients who experience nightmares	--

Supplementary Box 1. The steps involved in cleaning and recategorizing patients' initial psychiatric codings for the number of psychiatric disorders (Aims 1-3) and for *broad* psychiatric disorder groups (Aim 4)

I. Classified patients with self-reported depressive disorders into the unipolar mood features group

- Patients who were initially coded as 1s for depressive disorder(s) or who reported depression *in addition to* bipolar disorder(s) and/or in addition to some other bipolar mood feature (i.e., schizoaffective disorder, bipolar type) were coded as 0s for the unipolar mood features group

II. Classified patients who self-reported psychosis, self-reported a disorder on the schizophrenia spectrum, *and/or* were coded as having psychosis for the "psychosis or not" stratification variable into the psychosis group

III. Classified patients with self-reported bipolar disorders into the bipolar mood features group

- Patients who were initially coded as 1s for depressive disorder(s) or who reported depression *in addition to* bipolar disorder(s) and/or in addition to some other bipolar mood feature (i.e., schizoaffective disorder, bipolar type) were coded as 1s for the bipolar mood features group

IV. Classified patients with self-reported schizoaffective disorder but who so far had not been classified into the unipolar mood features or bipolar mood features group into the unspecified mood features group

V. Corrected remaining inconsistencies across codes and text responses and tabulated number of *total* disorders[a] across *all broad* psychiatric categories (see *Psychiatric Disorder Variables* in the *Methods* section) for each patient for Aim 4 analyses

VI. Subset IDs and data for participants within each *broad* psychiatric category for Aim 4 analyses[b]

Note: [a]In some cases, patients reported more than one disorder within the same *broad* psychiatric category. However, for cases in which one disorder superseded another, both disorders were *not* included and codings and total number of disorders were adjusted accordingly. For example, one individual who reported both "bipolar disorder" and "substance induced manic" was considered to have only one disorder within the bipolar mood features category. [b]Only the five most commonly reported *broad* psychiatric disorder groups were ultimately analyzed for Aim 4. Many patients fell into more than one of these five categories.

Supplementary Table 2. Pre and Post Means and SDs for the five main outcomes for the Immediate TranS-C and Usual Care-Delayed Treatment conditions

Outcome	Immediate TranS-C (N=253)		UC-DT (N=236)	
	Pre	Post	Pre	Post
DSM-5	24.9 (8.6)	19.6 (10.4)	24.6 (9.1)	23.2 (8.7)
Missing	7	129	1	26
PROMIS-SD	63.2 (7.2)	51.8 (10.6)	62.9 (7.7)	61.8 (8.0)
Missing	5	128	3	25
PROMIS-SRI	62.2 (8.8)	52.6 (10.7)	62.0 (7.7)	60.6 (8.2)
Missing	3	129	0	25
SHC	2.0 (1.4)	3.4 (1.5)	2.1 (1.3)	2.3 (1.5)
Missing	26	133	25	49
SDS	5.2 (2.8)	3.1 (2.7)	5.4 (2.7)	5.0 (2.8)
Missing	1	128	0	25

Note: Means are displayed, followed by SDs in parentheses, for each outcome. Ns represent the number of participants initially assigned to each condition, not accounting for missing responses. DSM-5 = DSM-5 Cross-Cutting Measure; PROMIS-SD = Patient-Reported Outcomes Measurement Information System-Sleep Disturbance; PROMIS-SRI = Patient-Reported Outcomes Measurement Information System-Sleep Related Impairment; SHC = Sleep Health Composite; SDS = The mean of each patient's available responses to the items on the Sheehan Disability Scale.

Supplementary Table 3. Pre and Post Means and SDs for the five main outcomes for the Adapted TranS-C and Standard TranS-C conditions

Outcome	Adapted (N=340)		Standard (N=149)	
	Pre	Post	Pre	Post
DSM-5	24.8 (8.7)	21.9 (9.2)	24.7 (9.2)	21.8 (10.3)
Missing	5	96	3	59
PROMIS-SD	62.8 (7.6)	57.9 (10.4)	63.6 (7.1)	58.7 (10.0)
Missing	6	96	2	57
PROMIS-SRI	62.0 (8.2)	57.4 (10.3)	62.3 (8.5)	58.4 (8.9)
Missing	2	96	1	58
SHC	2.1 (1.3)	2.8 (1.6)	1.9 (1.4)	2.6 (1.7)
Missing	37	115	14	67
SDS	5.4 (2.7)	4.1 (2.9)	5.2 (2.9)	4.7 (2.9)
Missing	0	96	1	57

Note: Means are displayed, followed by SDs in parentheses, for each outcome. Ns represent the number of participants initially assigned to each condition, not accounting for missing responses. DSM-5 = DSM-5 Cross-Cutting Measure; PROMIS-SD = Patient-Reported Outcomes Measurement Information System-Sleep Disturbance; PROMIS-SRI = Patient-Reported Outcomes Measurement Information System-Sleep Related Impairment; SHC = Sleep Health Composite; SDS = The mean of each patient's available responses to the items on the Sheehan Disability Scale.

Supplementary Table 4. Usual Care-Delayed Treatment Pre and Post Means and SDs for the five main outcomes in the unipolar mood features, bipolar mood features, anxiety disorders, psychosis, and trauma and stressor-related disorders groups, respectively

Outcome	unipolar (N = 119)		bipolar (N = 51)		anxiety (N = 148)		psychosis (N = 80)		trauma (N = 69)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
DSM-5	26.1 (8.4)	24.2 (8.6)	25.5 (9.7)	24.2 (9.4)	24.5 (8.7)	23.0 (8.6)	27.5 (9.6)	27.7 (9.3)	26.9 (9.3)	23.2 (8.6)
Missing	1	12	0	9	1	17	0	12	1	7
PROMIS-SD	64.0 (7.5)	63.2 (7.5)	62.5 (8.5)	61.9 (8.5)	63.4 (7.2)	62.6 (7.3)	62.4 (8.1)	61.1 (9.0)	64.5 (6.8)	62.6 (8.2)
Missing	2	12	0	8	2	17	1	12	1	8
PROMIS-SRI	63.4 (7.2)	61.8 (7.6)	61.2 (9.4)	60.6 (9.4)	62.6 (7.8)	61.1 (8.1)	61.3 (8.6)	59.3 (9.0)	63.5 (6.7)	61.3 (8.3)
Missing	0	12	0	8	0	17	0	12	0	8
SHC	2.0 (1.4)	2.1 (1.4)	2.1 (1.4)	2.2 (1.4)	2.0 (1.3)	2.2 (1.3)	2.2 (1.2)	2.1 (1.5)	1.8 (1.3)	2.2 (1.6)
Missing	9	27	8	11	16	32	11	18	11	16
SDS	5.9 (2.5)	5.4 (2.8)	5.3 (2.8)	4.4 (2.7)	5.6 (2.5)	5.2 (2.7)	4.9 (2.8)	4.8 (2.9)	5.7 (2.2)	5.3 (2.6)
Missing	0	12	0	8	0	17	0	12	0	8

Note: Means are displayed, followed by SDs in parentheses, for each outcome in the Usual Care-Delayed Treatment group. Ns represent the number of participants in each psychiatric group, not accounting for missing responses. DSM-5 = DSM-5 Cross-Cutting Measure; PROMIS-SD = Patient-Reported Outcomes Measurement Information System-Sleep Disturbance; PROMIS-SRI = Patient-Reported Outcomes Measurement Information System-Sleep Related Impairment; SHC = Sleep Health Composite; SDS = The mean of each patient's available responses to the items on the Sheehan Disability Scale.

Supplementary Table 5. Immediate TranS-C Pre and Post Means and SDs for the five main outcomes in the unipolar mood features, bipolar mood features, anxiety disorders, psychosis, and trauma and stressor-related disorders groups, respectively

Outcome	unipolar (N = 132)		bipolar (N = 67)		anxiety (N = 144)		psychosis (N = 86)		trauma (N = 74)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
DSM-5	24.9 (8.4)	19.5 (11.3)	25.9 (9.4)	22.6 (10.8)	26.3 (9.0)	20.5 (11.4)	28.2 (9.3)	24.4 (11.3)	26.7 (8.1)	21.8 (8.6)
Missing	3	70	3	36	6	70	4	42	1	39
PROMIS-SD	62.3 (7.0)	52.1 (9.3)	65.2 (7.5)	51.9 (12.2)	63.4 (7.2)	52.6 (9.8)	62.9 (7.4)	53.3 (11.0)	64.8 (5.7)	54.2 (9.9)
Missing	2	69	3	36	1	70	0	41	2	39
PROMIS-SRI	62.8 (8.7)	52.5 (9.6)	63.1 (8.5)	53.8 (12.9)	63.4 (8.7)	53.8 (10.8)	61.5 (8.8)	51.9 (12.4)	63.9 (8.0)	54.6 (11.0)
Missing	2	70	1	36	2	70	0	42	1	39
SHC	2.0 (1.4)	3.7 (1.6)	2.1 (1.4)	3.0 (1.7)	1.9 (1.3)	3.5 (1.6)	2.1 (1.4)	3.1 (1.4)	1.8 (1.3)	3.3 (1.7)
Missing	10	72	10	38	16	73	12	42	8	40
SDS	5.1 (2.6)	2.9 (2.7)	5.7 (2.8)	3.2 (2.8)	5.6 (2.5)	3.3 (2.8)	5.2 (2.9)	3.4 (3.0)	5.6 (2.5)	3.7 (2.9)
Missing	1	69	0	36	0	70	0	41	0	39

Note: Means are displayed, followed by SDs in parentheses, for each outcome in the Immediate TranS-C Treatment group. Ns represent the number of participants in each psychiatric group, not accounting for missing responses. DSM-5 = DSM-5 Cross-Cutting Measure; PROMIS-SD = Patient-Reported Outcomes Measurement Information System-Sleep Disturbance; PROMIS-SRI = Patient-Reported Outcomes Measurement Information System-Sleep Related Impairment; SHC = Sleep Health Composite; SDS = The mean of each patient's available responses to the items on the Sheehan Disability Scale.

Supplementary Table 6. Fixed effects coefficients (*b*)s, standard errors, and *p*-values associated with Aim 4, after adjusting for covariates

Outcome	unipolar			bipolar			anxiety			psychosis			trauma		
	b	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*
DSM-5	-4.249	1.247	**.001**	-1.097	1.829	.549	-4.253	1.125	**<.001**	-3.400	1.607	**.035**	-0.721	1.510	.633
PROMIS-SD	-9.657	1.276	**<.001**	-11.819	2.532	**<.001**	-9.695	1.284	**<.001**	-7.845	1.777	**<.001**	-8.367	1.862	**<.001**
PROMIS-SRI	-8.736	1.494	**<.001**	-8.917	2.128	**<.001**	-8.076	1.327	**<.001**	-7.623	1.898	**<.001**	-7.836	1.870	**<.001**
SHC	1.717	0.286	**<.001**	0.805	0.373	**.032**	1.433	0.248	**<.001**	1.117	0.297	**<.001**	1.293	0.395	**.001**
SDS	-1.808	0.425	**<.001**	-1.524	0.759	**.046**	-1.901	0.401	**<.001**	-1.951	0.581	**.001**	-1.320	0.601	**.029**

Note: The coefficient is the 2-way interaction between time and UC-DT vs. Immediate TSC condition. Non-transformed coefficients are included here for ease of interpretation. The listed SEs and *p*-values are based on robust estimation; the *p*-values listed are not corrected for multiple testing. Small discrepancies across values reported in the main text and Table 5 are due to rounding differences across softwares. unipolar = unipolar mood features; bipolar = bipolar mood features; anxiety = anxiety disorders; trauma = trauma and stressor-related disorders.

Supplementary Table 7. The number of patients with each possible combination of two broad disorder categories

	ndd	psych	anx	ocd	trauma	diss	pd	ed	sud	bipmood	unimood	unspec mood
ndd	**58**	15	36	8	18	1	5	0	3	14	29	1
psych	15	**166**	78	7	39	4	3	2	3	44	65	10
anx	36	78	**292**	16	88	5	12	2	3	61	177	2
ocd	8	7	16	**21**	11	4	2	2	0	5	11	0
trauma	18	39	88	11	**143**	5	4	2	2	37	67	0
diss	1	4	5	4	5	**6**	0	2	0	2	1	0
pd	5	3	12	2	4	0	**16**	0	0	8	5	0
ed	0	2	2	2	2	2	0	**4**	0	1	2	0
sud	3	3	3	0	2	0	0	0	**11**	1	4	0
bipmood	14	44	61	5	37	2	8	1	1	**118**	0	0
unimood	29	65	177	11	67	1	5	2	4	0	**251**	0
unspecmood	1	10	2	0	0	0	0	0	0	0	0	**10**

Note: The bolded diagonals represent the total number of cases for the disorder category in question. ndd = neurodevelopmental disorders; psych = psychosis; anx = anxiety disorders; ocd = obsessive-compulsive and related disorders; trauma = trauma and stressor-related disorders; diss = dissociative disorders; pd = personality disorders; ed = feeding and eating disorders; sud = substance-related and addictive disorders[a]; bipmood = bipolar mood features; unimood = unipolar mood features; unspecmood = unspecified mood features.

[a]The low prevalence of sud was likely the result of the study criterion that excluded patients who had substance abuse/dependence if it made participation in the study unfeasible.