

Supplemental Tables to:

**Caregivers' Internet-Delivered Insomnia Intervention Engagement and Benefit:
SHUTi-CARE Trial Primary Quantitative Analysis**

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Supplemental Table 1. Cognitive mechanisms, sleep outcomes, and other health outcomes by engagement with SHUTi

	Non-users			Incomplete users			Complete users		
	Pre-A M (SD)	Post-A M (SD)	Within-group Cohen's <i>d</i>	Pre-A M (SD)	Post-A M (SD)	Within-group Cohen's <i>d</i>	Pre-A M (SD)	Post-A M (SD)	Within-group Cohen's <i>d</i>
Sleep Beliefs (-)	92.61 (31.54)	—	—	92.68 (18.20)	61.12 (36.20)	0.85	86.08 (27.04)	54.82 (30.08)	0.88
Sleep Locus of Control – Internal (+)	17.06 (4.49)	—	—	14.77 (4.06)	15.94 (6.39)	0.08	15.02 (4.85)	16.93 (5.12)	0.38
Sleep Locus of Control – External (-)	9.11 (4.14)	—	—	8.14 (3.17)	6.69 (3.09)	0.47	8.68 (3.72)	6.75 (3.00)	0.43
Insomnia severity (-)	5.94 (1.47)	4.47 (1.85)	0.86	5.50 (1.06)	2.75 (1.39)	1.85	5.57 (1.31)	2.42 (1.44)	1.69
Sleep diary metrics									
SOL (-)	34.25 (25.71)	—	—	44.23 (36.25)	25.81 (13.50)	0.53	46.47 (48.10)	19.55 (17.56)	0.61
WASO (-)	64.13 (44.27)	—	—	62.93 (35.94)	50.90 (39.16)	0.39	74.47 (38.28)	39.82 (27.32)	0.90
No. awakenings (-)	2.02 (1.29)	—	—	2.01 (1.10)	1.40 (1.03)	0.76	2.35 (1.25)	1.59 (1.34)	0.70
Sleep quality (+)	2.98 (0.75)	—	—	2.87 (0.44)	3.36 (0.58)	0.94	2.86 (0.59)	3.41 (0.60)	0.71
Total sleep time (+)	6.02 (1.40)	—	—	6.27 (1.03)	6.81 (1.46)	0.32	6.13 (1.17)	6.64 (1.18)	0.58
Global physical health (+)	38.79 (7.62)	42.13 (9.43)	0.92	36.90 (6.32)	38.88 (4.10)	0.36	37.44 (5.54)	38.21 (6.36)	0.20
General distress (-)	4.44 (3.38)	3.71 (3.79)	0.07	3.77 (2.09)	2.88 (2.83)	0.31	3.98 (3.02)	2.60 (2.49)	0.48

Note: (-) denotes that higher score represents worse functioning / more caregiving burden; (+) denotes that higher score represents better functioning / less caregiving burden. Sleep diaries and self-reported cognitive mechanism data were not collected from non-users at post-assessment. Pre-A: Pre-assessment; Post-A: Post-assessment. Cohen's *d* values are represented as an absolute value; all within-group change in direction of expected effects (i.e., outcome improvement from pre- to post-assessment). SOL: Sleep onset latency; WASO: Wake after sleep onset.

Supplementary table 2. Associations between caregiving context and post-SHUTi sleep and other health outcomes
Supplementary table 2a. Caregiving-related user characteristics

Coeff (s.e.)	Caregiving stress (-)	Caregiving self-efficacy (+)	Caregiving guilt		
			Doing wrong by CR (-)	Failing to meet challenges (-)	Self-care (-)
Insomnia severity (-)	0.08 (0.07)	-0.01 (0.09)	0.01 (0.03)	0.02 (0.04)	-0.08 (0.04)
Sleep diary metrics					
SOL (-)	0.19 (0.44)	1.60 (1.01)	-0.10 (0.25)	-0.70 (0.38)	-0.28 (0.39)
WASO (-)	0.34 (1.11)	-0.50 (1.56)	-0.10 (0.58)	0.48 (0.81)	-1.24* (0.58)
No. awakenings (-)	-0.03 (0.03)	-0.02 (0.08)	-0.005 (0.02)	0.02 (0.04)	-0.06* (0.03)
Sleep quality (+)	-0.04 (0.02)	-0.02 (0.05)	-0.01 (0.01)	0.01 (0.02)	0.04* (0.02)
Total sleep time (+)	0.01 (0.04)	-0.13*** (0.03)	0.04** (0.01)	0.06*** (0.02)	0.03 (0.02)
Global physical health (+)	0.10 (0.14)	0.10 (0.22)	-0.10 (0.07)	-0.004 (0.11)	-0.14 (0.11)
General distress (-)	0.16* (0.08)	-0.11 (0.15)	0.10* (0.05)	0.01 (0.07)	-0.06 (0.08)

Supplementary table 2b. Caregiving-related environmental characteristics

Coeff (s.e.)	Proximity to CR (relative to Bedpartner)		Caregiving tasks					
	Live together, sleep separate	Other living situation	CR functional status (+)	CR cognitive status (-)	CR problem behavior (-)	ADL (-)	IADL/ CSA (-)	Medical/ nursing tasks‡ (-)
Insomnia severity (-)	0.03 (0.47)	0.16 (0.46)	-0.02 (0.03)	-0.02 (0.02)	0.03 (0.03)	0.04 (0.08)	0.11* (0.06)	0.24 (0.35)
Sleep diary metrics								
SOL (-)	5.62 (3.09)	6.60* (3.01)	-0.04 (0.31)	-0.29 (0.23)	-0.14 (0.31)	-0.56 (0.87)	-0.66 (0.63)	-3.10 (2.82)
WASO (-)	-14.4 (9.08)	-8.71 (8.53)	-0.002 (0.58)	-0.01 (0.46)	-0.83* (0.38)	-0.13 (1.30)	-1.02 (1.52)	-5.03 (6.31)
No. awakenings (-)	-0.26 (0.27)	-0.32 (0.30)	0.02 (0.02)	-0.01 (0.01)	-0.02 (0.01)	-0.03 (0.05)	0.01 (0.04)	-0.14 (0.23)
Sleep quality (+)	0.19 (0.19)	0.01 (0.17)	-0.01 (0.01)	0.02 (0.01)	0.02 (0.01)	0.03 (0.03)	0.02 (0.03)	0.01 (0.16)
Total sleep time (+)	0.05 (0.27)	-0.22 (0.27)	0.001 (0.02)	0.01 (0.01)	0.03 (0.02)	0.01 (0.05)	-0.04 (0.06)	-0.04 (0.20)
Global physical health (+)	-1.08 (1.46)	-2.06 (1.39)	-0.03 (0.10)	-0.01 (0.07)	-0.05 (0.08)	-0.09 (0.26)	0.02 (0.22)	1.23 (1.02)
General distress (-)	-1.27 (0.85)	-1.70* (0.80)	0.09* (0.04)	-0.04 (0.03)	0.01 (0.04)	-0.07 (0.13)	0.17* (0.09)	0.81 (0.54)

* $p < .05$, ** $p < .01$, *** $p < .001$

Note: (-) denotes that higher score represents worse functioning / more caregiving burden; (+) denotes that higher score represents better functioning / less caregiving burden. SOL: Sleep onset latency; WASO: Wake after sleep onset.

Supplemental Table 3. Summary of significant effects between baseline caregiving characteristics and treatment outcomes

Type	High caregiving burden characteristic	Outcomes with Better Improvement	Outcomes with Worse Improvement
User characteristic	High caregiving stress		General distress
	Low caregiving self-efficacy	TST	
	High guilt about doing wrong by CR	TST	General distress
	High guilt about failing to meet challenges	TST	
	High guilt about self-care	WASO Number of awakenings Sleep quality	
Environmental characteristic	Bedpartner with CR (vs. live apart)	SOL	General distress
	Worse care recipient functioning	Likelihood to use SHUTi Likelihood to complete SHUTi General distress	
	More frequent CR problem behavior	WASO	
	More ADL supported	Likelihood to complete SHUTi	
	More IADL / CSA supported		External sleep locus of control Insomnia severity General distress

Note: Outcomes improvement is ‘better’ or ‘worse’ for caregivers reporting higher levels of burden per a characteristic at baseline relative to outcomes for caregivers reporting lower levels of burden for that characteristic. CR: Care recipient; ADL: Activities of Daily Living; IADL: Instrumental ADL; CSA: Caregiver support activities; TST: Total sleep time; WASO: Wake after sleep onset; SOL: Sleep onset latency.